TRAFFIC STUDY

For

The Venezia Subdivision

in the County of Imperial

Submitted To:

CITY OF CALEXICO

Submitted By:

Darnell & Associates, Inc.

Original Date October 11, 2005

Darnell & ASSOCIATES, INC.
TRANSPORTATION PLANNING & TRAFFIC ENGINEERING

October 11, 2005

Tony Wong
City Engineer
City of Calexico
608 Heber Avenue
Calexico, CA 92231

D&A Ref. No.: 050706

Subject: Traffic Study for the Proposed Venezia Subdivision located south of the intersection of Bowker Road and State Route 98 in Imperial County.

Dear Mr. Wong:

Darnell & Associates, Inc. (D&A) has prepared this traffic study to access the impacts of the Venezia subdivision along State Route 98. The project is located south of the intersection of Bowker Road and State Route 98 (SR98) in the County of Imperial.

The traffic study analyzes the traffic impacts related to the proposed project on local roadways and intersections for existing, existing plus project, existing plus cumulative projects, existing plus cumulative projects plus the proposed project (near term cumulative), as well as the future year 2030.

If you have any questions, please feel free to contact the office.

Sincerely,

DARNELL & ASSOCIATES, INC.

Rebecca L Peaslee

Rebecca L Peaslee, E.I.T.
Senior Transportation Planner

Jonathan Levy, P.E.
Principal Engineer
RCE 39712

Date Signed: 10-11-05

BED/rlp
050706 Venezia/10-05

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FOR

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IN THE
COUNTY OF IMPERIAL

Submitted To:

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608 Heber Avenue
Calexico, CA 92231

Submitted By:

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050706 Venezia/10-05

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EXECUTIVE SUMMARY

The Venezia subdivision is located south of the intersection of Bowker Road and State Route 98 (SR98). The project consists of approximately 249 single family dwelling units and 13.89 acres of commercial property (approximately 138.259 net building square-footage). The project will generate approximately 19,081 average daily trips, 863 AM peak hour trips, and 1,908 PM peak hour trips. When pass-by reductions are applied to the project, the project will generate 10,288 average daily new trips, 511 AM peak hour trips, and 1,244 PM peak hour trips.

This report has been prepared to supplement the traffic studies prepared for the Venezia Project , CM Ranch and other studies proposed for the area to address the California Department of Transportation concerns along SR98 and the intersections of SR98 and Bowker Road.

This report addresses the following: Existing Conditions, Project Trip Generation, Existing Plus Project Conditions, Short Term Conditions, Near Term Cumulative Conditions, Future Conditions (Year 2030), Traffic Impacts, and mitigation measures. The project impacts are summarized in Section IV, and the recommended mitigation is summarized in Section VI.

SECTION I – INTRODUCTION

PROJECT DESCRIPTION

The Venezia subdivision is located south of the intersection of Bowker Road and State Route 98. The project consists of approximately 249 single family dwelling units and 13.89 acres of commercial property (approximately 138.259 net building square-footage). A vicinity map is provided in Figure 1 and the project's site plan is illustrated in Figure 2.

CONGESTION MANAGEMENT PROGRAM

Based on the approval of Proposition 111 in 1990, regulations require the preparation, implementation and annual updating of a Congestion Management Program (CMP) in each of California's urbanized counties. One required element of the CMP is a process to evaluate the transportation and traffic impacts of large projects on the regional transportation system. That process is undertaken by local agencies, project applicants and traffic consultants through a transportation impact report usually conducted as part of the CEQA project review process. Authority for local land use decisions including project approvals and any required mitigation remains the responsibility of local jurisdictions.

The criteria for which a project is subject to the regulations as set forth in the CMP are determined by the trip generation potential for the project. Currently, the average daily traffic (ADT) threshold is 2,400 vehicles or 200 peak hour trips. The proposed project will generate approximately 19,081 total daily trips (see Section III, Project Related Conditions) and is therefore subject to CMP guidelines for traffic impact studies.

SCENARIOS STUDIED

The traffic scenarios analyzed in this report are identified as follows:

Existing Conditions refers to that condition which exists on the ground today (Year 2005), including existing traffic counts and existing lane configurations at intersections and on roadway segments.

Existing Plus Project Conditions refers to that condition which includes the project traffic added onto existing volumes.

Existing + CM Ranch Conditions refers to that condition which will exists once the State Route 98 (SR98)/Bowker Road is being redesigned and the southern leg is closed off. This scenario includes traffic from CM Ranch, which is located just south of the proposed project, added onto the existing traffic volumes with the SR98/Bowker Road intersection adjusted to not allow traffic on the southern leg..

Short Term Conditions refers to that condition which includes the project traffic added onto existing plus CM Ranch volumes.

Existing Plus Other Projects Conditions refers to that condition which includes other approved/pending projects in the study area plus the existing traffic volumes. This scenario shows the impact without project.

Near Term Cumulative Conditions refers to that condition which includes the other approved/pending projects in the sphere of influence of the study area plus the project traffic plus the existing traffic volumes. This scenario shows the impact with the project.

Year 2030 Conditions refers to that condition which will exist in the year 2030, including proposed improvements to the local intersections and roadway segments.

Year 2030 Plus Project Conditions refers to that condition which includes the project traffic added onto the Year 2030 forecasted traffic volumes.

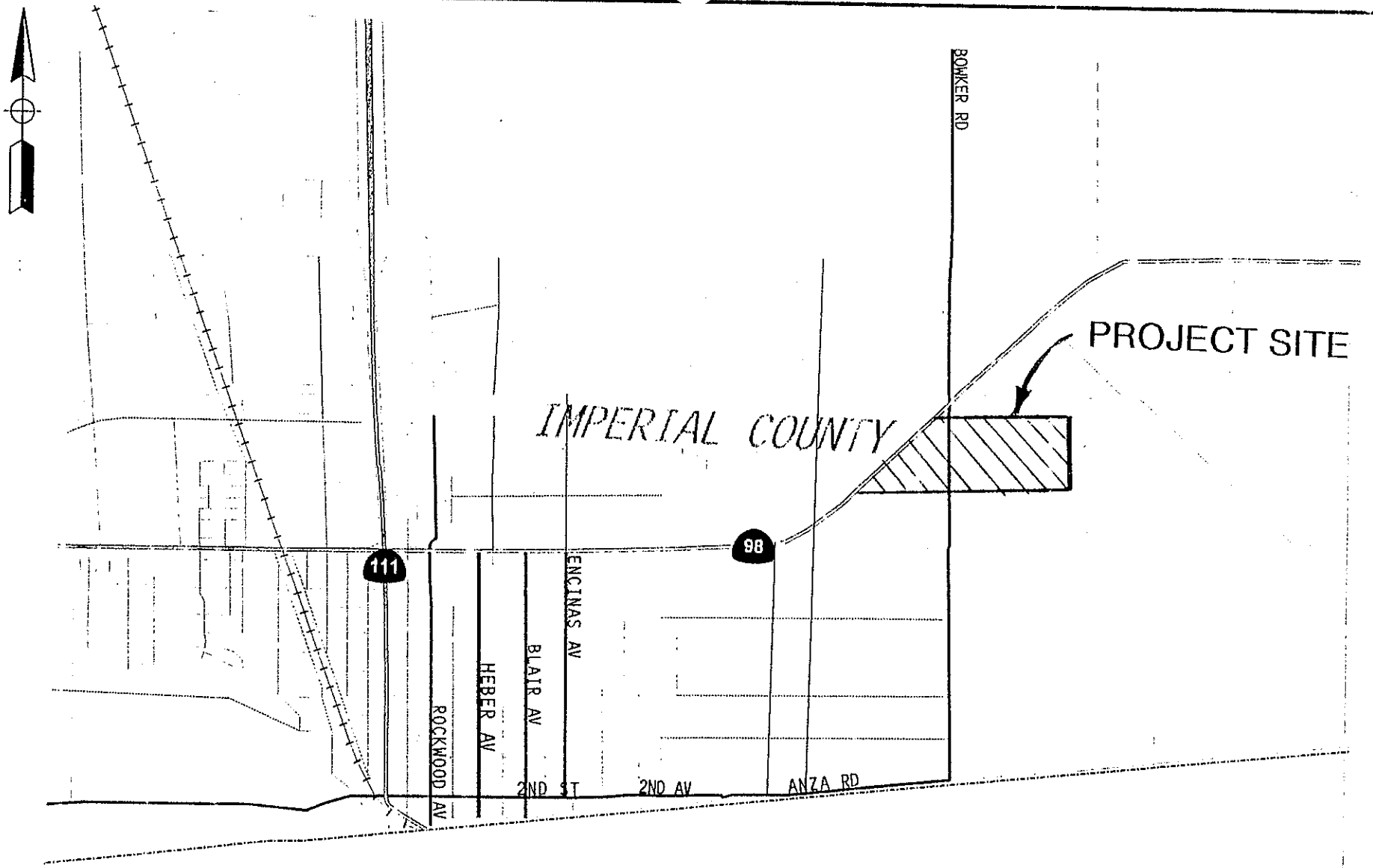

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FIGURE 1

VICINITY MAP

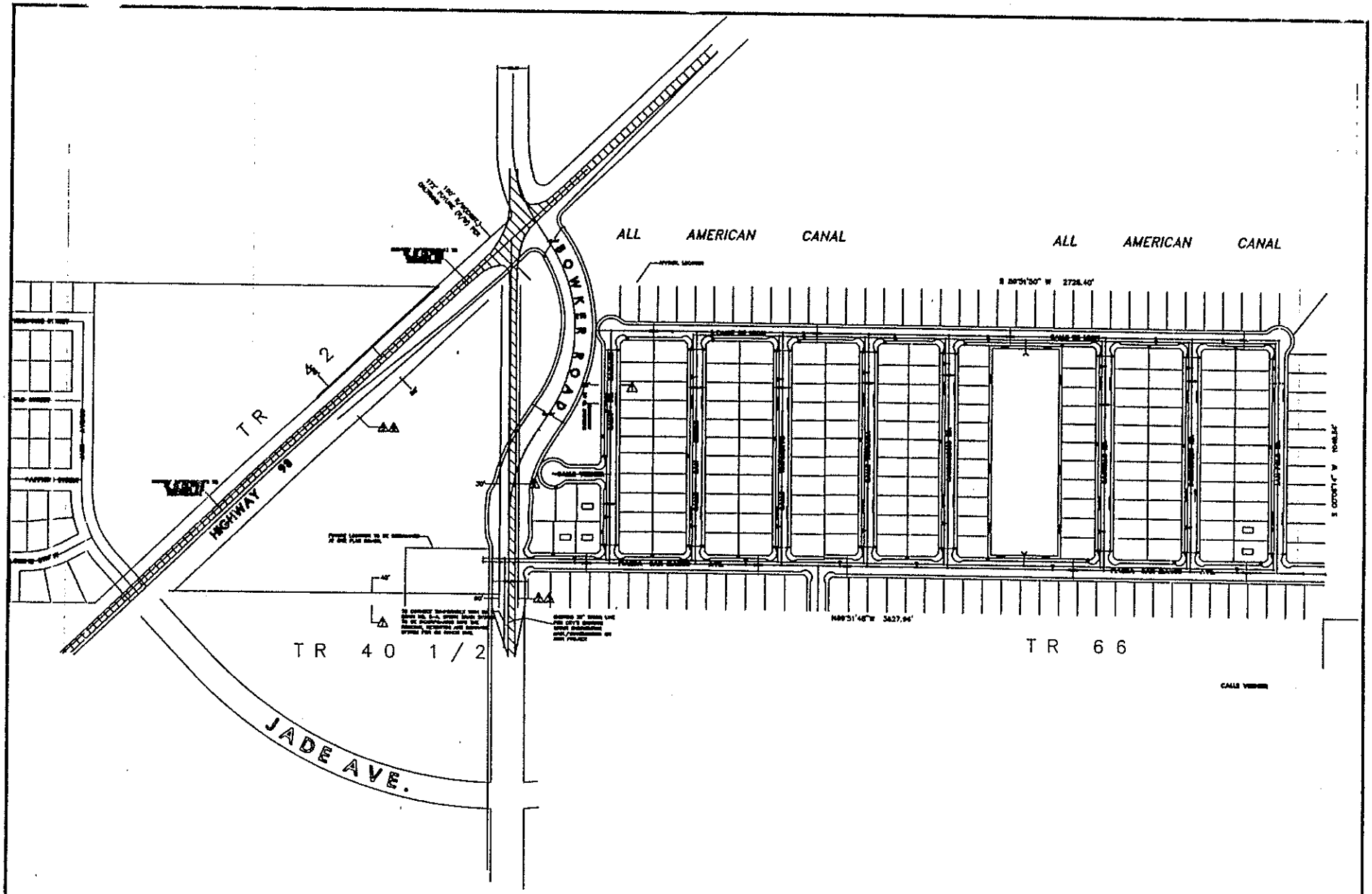

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FIGURE 2

SITE PLAN

LEVEL OF SERVICE

Level of Service (LOS) is a professional industry standard by which the operating conditions of a given roadway segment or intersection are measured. Level of Service is defined on a scale of A to F; where LOS A represents the best operating conditions and LOS F represents the worst operating conditions. LOS A facilities are characterized as having free flowing traffic conditions with no restrictions on maneuvering or operating speeds; traffic volumes are low and travel speeds are high. LOS F facilities are characterized as having forced flow with many stoppages and low operating speeds. Table 1 shows the average daily traffic volumes (ADT), average travel speeds, and delay ranges that are equivalent to each level of service.

The County of Imperial accepts LOS D at intersections and LOS C at roadway segments. It should be noted that the County of Imperial will accept LOS D at roadway segments if the segment operates at LOS D or better during the peak hours.

Table 1 - Level of Service Ranges

LOS	Intersections		Roadway Segments		
			Daily	Peak Hour	
	Signalized- Delay (Seconds/Vehicle)[1]	Unsignalized Delay (Seconds/Vehicle)[1]	Average Daily Traffic (ADT)[2]	2-Lane Highways	Avg. Travel Speed (mph)
				Avg. Travel Speed (mph)	Max Density (pc/mi/ln)
A	Less than or Equal to 10.0	Less than or Equal to 10.0	Less than 1,900	Greater Than 55	11
B	10.1 to 20.0	10.1 to 15.0	1,900 to 4,100	Greater Than 50 to 55	18
C	20.1 to 35.0	15.1 to 25.0	4,100 to 7,100	Greater Than 45 to 50	26
D	35.1 to 55.0	25.1 to 35.0	7,100 to 10,900	Greater than 40 to 45	35
E	55.1 to 80.0	35.1 to 50.0	10, 900 to 16,200	Less Than or Equal to 40	43
F	Greater Than 80.0	Greater Than 50.1	Greater than 16,200	Flow Rate Exceeds Capacity	Highly Unstable & Variable Traffic Flow

[1] The delay ranges shown are based on the 2000 Highway Capacity Manual (HCM)
[2] The volume ranges are based on the County of Imperial thresholds for a Collector Street, additional roadway segment classifications can be found in Appendix A.
[3] The average travel speeds shown are based on the 2000 HCM.
LOS = Level of Service; mph = miles per hour

ANALYSIS METHODOLOGY

The roadway segment daily LOS was determined by comparing the average daily traffic (ADT) volumes under all scenarios to the capacity of the roadway according to its roadway cross-section and classification. For the purpose of this report, the daily traffic volumes of the roadway segments in the vicinity of the project were compared to the Imperial County Level of Service thresholds. A copy of the City of Imperial Circulation Element is included in Appendix A.

To comply with Caltrans standards, D&A utilized the Highway Capacity Software (HCS), version 4.1e, two lane and multi-lane highway modules to analyze the peak hour level of service. For two lane highways, the peak hour level of service is primarily based on average travel speed, and for multi-lane highways the peak hour level of service is primarily based on the density in passenger cars per mile per lane (pc/mi/ln). It should be noted that HCS, version 4.1e is based on the 2000 Highway Capacity Manual (HCM).

Synchro, version 6, was utilized to analyze the morning and afternoon peak hour conditions of the intersections in the project vicinity. The signalized intersection methodology defines LOS based on delay using variables such as lane configuration, traffic volumes and signal timings. The unsignalized intersection methodology defines LOS based on the longest delay experienced by any single movement. Since the Synchro program calculates the average delay per vehicle, there may be instances where the Synchro analysis will show a reduction in delay with the addition of more traffic. This phenomenon occurs when the additional traffic is added to a movement that experiences a shorter amount of delay, thereby decreasing the intersections average delay per vehicle (i.e. a larger amount of vehicles will have to wait a shorter time while only a few vehicles have to wait an extended period of time). It should be noted, however, that even if the addition of traffic results in a lower average intersection delay per vehicle, the total delay at the intersection will gradually increase as more traffic is added to the intersection. The measure of effectiveness utilized within this report is the average intersection delay, not the total intersection delay. It should be noted that Synchro software is based on the 2000 HCM.

To comply with Caltrans guidelines, the signalized intersection of State Route 98 and Meadows Road/Andrade Road was also analyzed using the Intersecting Lane Vehicle (ILV) methodology. The ILV method determines the operating condition of an intersection based upon the number of intersecting vehicles that enter the intersection per lane during the hour (ILV/hr). Where less than 1200 ILV/hr represents stable flow , 1200 to 1500 ILV/hr represents unstable flow with considerable delays possible, and 1500 ILV/hr represents capacity, or stop-and-go operation with severe delay and heavy congestion.

REPORT ORGANIZATION

Following this section, Section II evaluates the existing roadway characteristics and traffic conditions surrounding the project area. Section III examines the project trip generation and distribution assumptions. Section IV analyzes the traffic for existing plus project, near term cumulative conditions with and without the proposed project, and 2030 conditions with and without the proposed project. Section V addresses project access. Section VI provides recommended mitigation measures. Section VII provides a summary of the report's findings and conclusions.

SECTION II - EXISTING CONDITIONS

This section of the traffic study is intended to assess the existing conditions of the roadways and intersections within the vicinity of the project to determine travel flow and/or delay difficulties, if any, that exist prior to adding the traffic generated by the proposed project. The existing conditions analysis establishes a base condition which is used to assess the other scenarios discussed in this report.

Darnell & Associates, Inc. (D&A) conducted a field review of the area surrounding the project in August 2005. The existing roadway geometrics are illustrated in Figure 3.

EXISTING ROADWAY CHARACTERISTICS

The key segments analyzed in the study area are identified below:

State Route 98 (SR98): SR98 is classified as a State Highway on the Imperial County Circulation Element. SR98 is an east-west facility which currently provides two lanes of travel in each direction west of Meadows Road and one lane of travel in each direction east of Meadows Road. The posted speed limit is 45 mph between Rockwood Avenue and Bowker Road, and 65 mph between Bowker Road and Barbara Worth Road. There are no bike lanes or bus stops provided and curbside parking is prohibited. The current cross section of SR98 west of Meadows Road is equivalent to that of a Secondary Arterial, capacity of 34,200 Average Daily Traffic (ADT) at level of service (LOS) E. The current cross section of SR98 east of Meadows Road is equivalent to that of a Collector, capacity of 16,200 ADT at LOS E.

Bowker Road is a north/south two lane undivided circulation element roadway. No bike lanes or bus stops are provided and curbside parking is prohibited. The posted speed limit is 50 mph within the project vicinity. The current cross section is equivalent to that of a Collector, capacity of 16,200 ADT at LOS E.

ROADWAY SEGMENT DAILY TRAFFIC

Traffic counts along SR98 were obtained from CALTRANS from their 2004 counts. Traffic counts on Bowker Road were obtained from the traffic study for the CM Ranch, *Draft Traffic Impact Study Report CM Ranch,* prepared by Albert A Webb Associates Engineering Consultants. Figure 4 presents the existing conditions traffic volumes used in this analysis. Excerpts from the CM Ranch report and count summaries are included in Appendix A.

KEY INTERSECTIONS

Figure 3 provides intersection configurations and traffic control for the key intersections. The key intersections analyzed in the study area are identified below:

- State Route 98 (SR98)/Meadows Road (Signalized);
- SR98/Rivera Road (One Way Stop Controlled); and
- SR98/Bowker Road (Two-Way Stop Controlled).

The SR98/Bowker Road intersection is currently constructed with SR98 crossing Bowker Road to form a skewed intersection. The skewed intersection configuration is created by the combination of east/west diagonal alignment of SR98 and the location of the major Imperial Irrigation Canal. Caltrans has requested that the applicant realign Bowker Road to create an intersection with SR98 more closely crossing to 90 degrees. The projects site plan has been redesigned to accommodate this request.

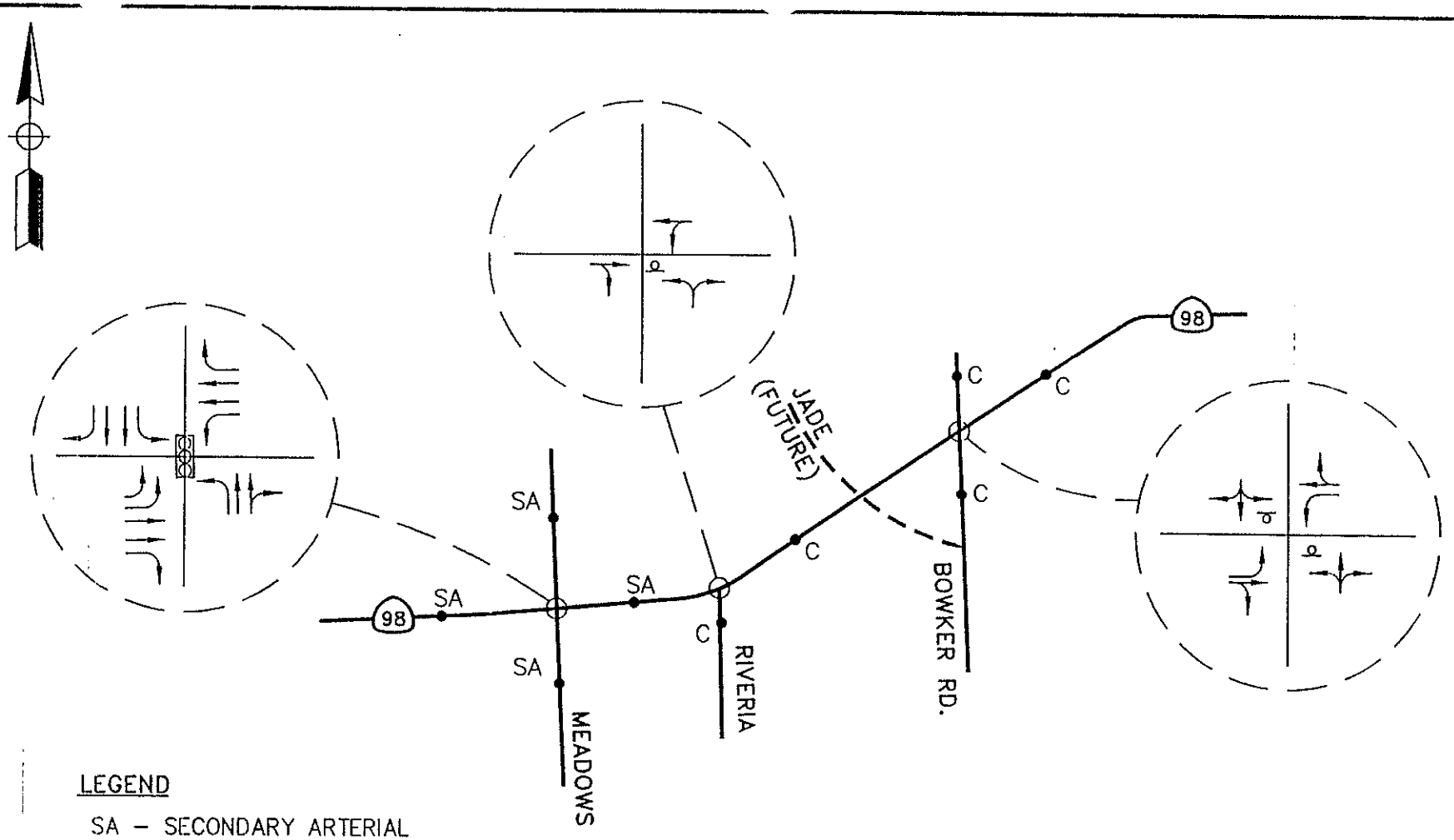

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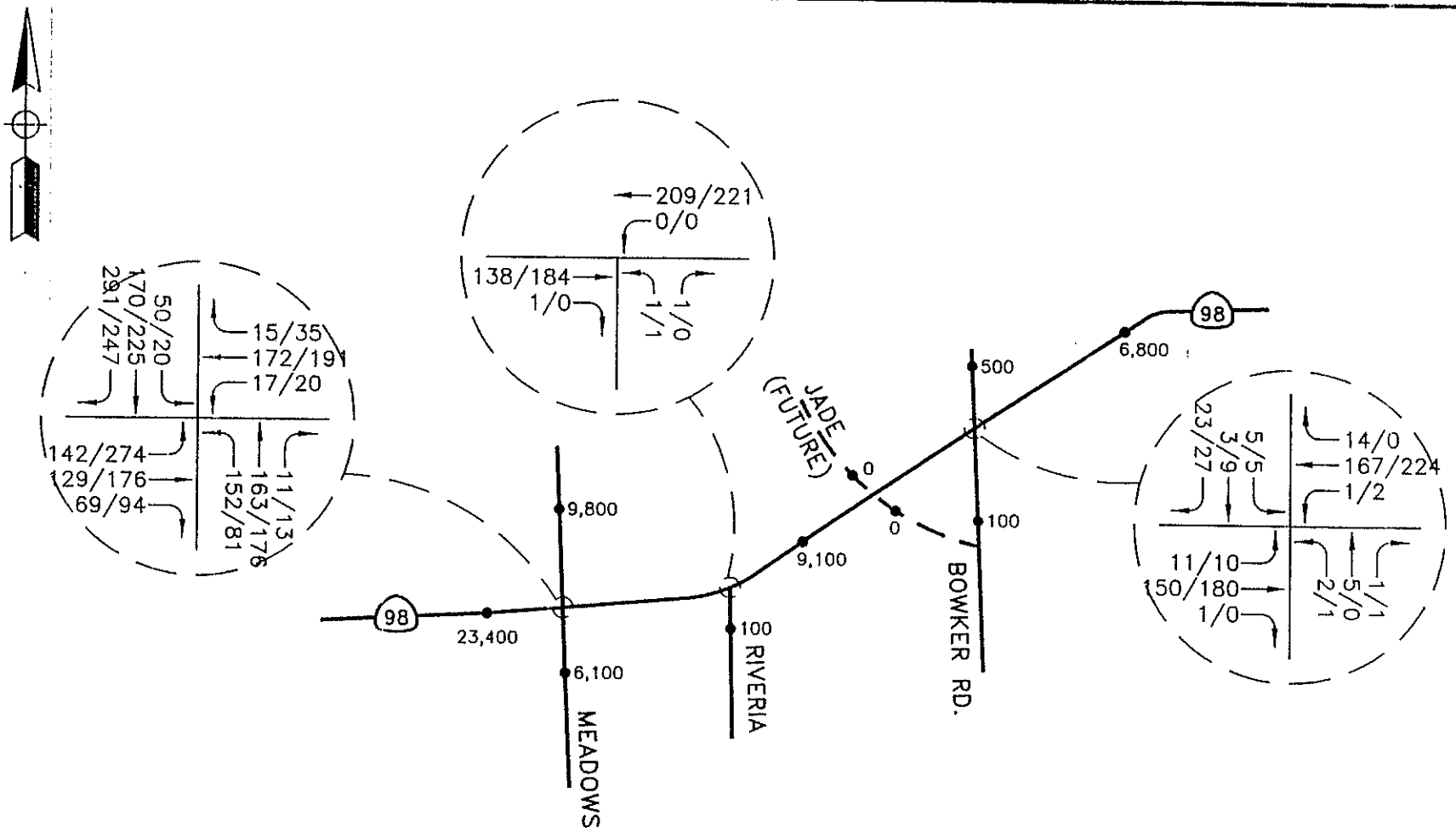
FIGURE 3

EXISTING CONDITIONS



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

——→ – DIRECTION OF TRAVEL

– – – – – FUTURE ROAD

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FIGURE 4

EXISTING TRAFFIC VOLUMES

INTERSECTION TRAFFIC COUNTS

Intersection turn counts were obtained from the traffic study for the CM Ranch, *Draft Traffic Impact Study Report CM Ranch,* prepared by Albert A Webb Associates Engineering Consultants. Figure 4 presents the existing conditions traffic volumes used in this analysis. Excerpts from the CM Ranch report and count summaries are included in Appendix A.

EXISTING LEVEL OF SERVICE CONDITIONS

Roadway Segments

As can be seen in Table 2, under Daily Roadway segment conditions, all analyzed segments except SR98 between Meadows Road and Bowker Road operates at LOS D or better. SR98 between Meadows Road and Bowker Road operates at LOS D. Per CALTRANS requirements, State Route 98 was also analyzed under peak hour conditions and was found to operate at LOS B or better during the peak hours. Due to the high speed limit on the roadway segment of Bowker Road between Cole Road and SR98, it was also treated as a highway and analyzed under peak hour conditions. Bowker Road between Cole Road and SR98 was found to operate at LOS C during the peak hours.

Intersections

The level of service analysis of the intersections can be found in Table 3. As can be seen in Table 3, all analyzed intersections operate at LOS B or better under existing conditions. Per Caltrans requirements, ILV analysis was also performed for the SR98/Meadows Road-Andrade Road intersection. Table 4 summarizes the ILV analysis. Under existing conditions the SR98/Meadows Road-Andrade Road intersection operates at stable flow conditions. A copy of the Synchro and ILV analysis worksheets for conditions can be found in Appendix C.

Table 2 - Existing Roadway Segment Level of Service Summary

Daily

Roadway Segment	Class	Capacity1	ADT	LOS
SR98				
Rockwood To Meadows	SA	34,200	23,400	C
Meadows to Bowker	C	16,200	9,100	D
Bowker to Cole	C	16,200	6,800	C
Bowker				
Cole to SR98	C	16,200	500	A
South of SR98	C	16,200	100	A

Peak Hour

Multi Lanes

Roadway Segment	Class	AM Peak Hour				PM Peak Hour			
		Eastbound		Westbound		Eastbound		Westbound	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
SR98-Rockwood to Meadows/ Andrade	4LH	4.2	A	7.6	A	6.8	A	6.4	A

Two Lane

Segment	Segment Length (miles)	AM Peak Hour			PM Peak Hour		
		Avg Travel Speed (mph)	Travel Time (sec)	LOS	Avg Travel Speed (mph)	Travel Time (sec)	LOS
SR98							
Meadows/Andrade to Bowker	1.0	59.5	60.5	A	59.0	61.0	B
Bowker to Barbara Worth	2.2	56.3	140.7	A	55.6	142.4	A
Bowker							
Cole to SR98	0.5	49.2	36.6	C	49.3	36.5	C

Capacity is based on the upper limit of LOS E per the County of Imperial Level of Service Thresholds
ADT=Average Daily Traffic; LOS = Level of Service; C = Collector ; SA=Secondary Arterial; 4LH=Four lane highway

Table 3 - Existing Intersection Level of Service Summary					
Intersection	Critical Movement	AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SR98@ Meadows/Andrade (Sig)	Intersection	16.0	B	16.3	B
SR98 @Rivera (OWSC)	NB Approach	9.9	A	11.3	B
SR98 @ Bowker (TWSC)	NB Approach	11.4	B	11.1	B
	SB Approach	10.0	B	10.9	B

sec/veh = seconds of delay per vehicle; LOS = Level of Service; Sig=Signalized; OWSC=One-Way Stop Controlled; TWSC=Two-Way Stop Controlled.
NB = Northbound; SB = Southbound

Table 4 - Existing ILV Summary				
Intersection	AM Peak Hour		PM Peak Hour	
	ILV/Hour	Operating Condition	ILV/Hour	Operating Condition
SR98@ Meadows/Andrade	529	Stable Flow	427	Stable Flow

ILV=Intersecting Lane Volumes
<1200 ILV/hour = Stable Flow
1200 – 1500 ILV/hour = Unstable Flow
1500 ILV/hour = Capacity – Heavy Congestion

SECTION III - PROJECT RELATED CONDITIONS

TRIP GENERATION

The trip generation potential for the project is based on daily and peak hour trip generation rates obtained from the *(Not So) Brief Guide of Traffic Generators for the San Diego Region* published by the San Diego Association of Governments (SANDAG) in April 2002. Utilizing the SANDAG rates and the characteristics of the proposed project, estimates of daily and peak hour traffic volumes generated by the project can be calculated. Table 5 summarizes the trip generation rates and volumes for the proposed project. As shown in Table 5, the proposed development is estimated to generate 19,081 average daily trips, 863 AM peak hour trips, and 1,908 PM peak hour trips. A portion of the trips that will be generated by the Commercial portion of the project would already be traveling along the roadways, therefore pass-by reductions were applied. When pass-by reductions are applied to the project, the project will generate 10,288 average daily new trips, 511 AM peak hour trips, and 1,244 PM peak hour trips.

Table 5 - Trip Generation Rates and Calculations Summary

Trip Generation Rates

Land Use	Daily	AM Peak Hour			PM Peak Hour		
		Total - % of Daily	% In	% Out	Total - % of Daily	% In	% Out
Single Family Residential	10 Trips / DU	8%	30%	70%	10%	70%	30%
Commercial (Neighborhood)	120 Trips / ksf	4%	60%	40%	10%	50%	50%
Commercial Pass-by Reductions	53%	53%	-	-	40%	-	-

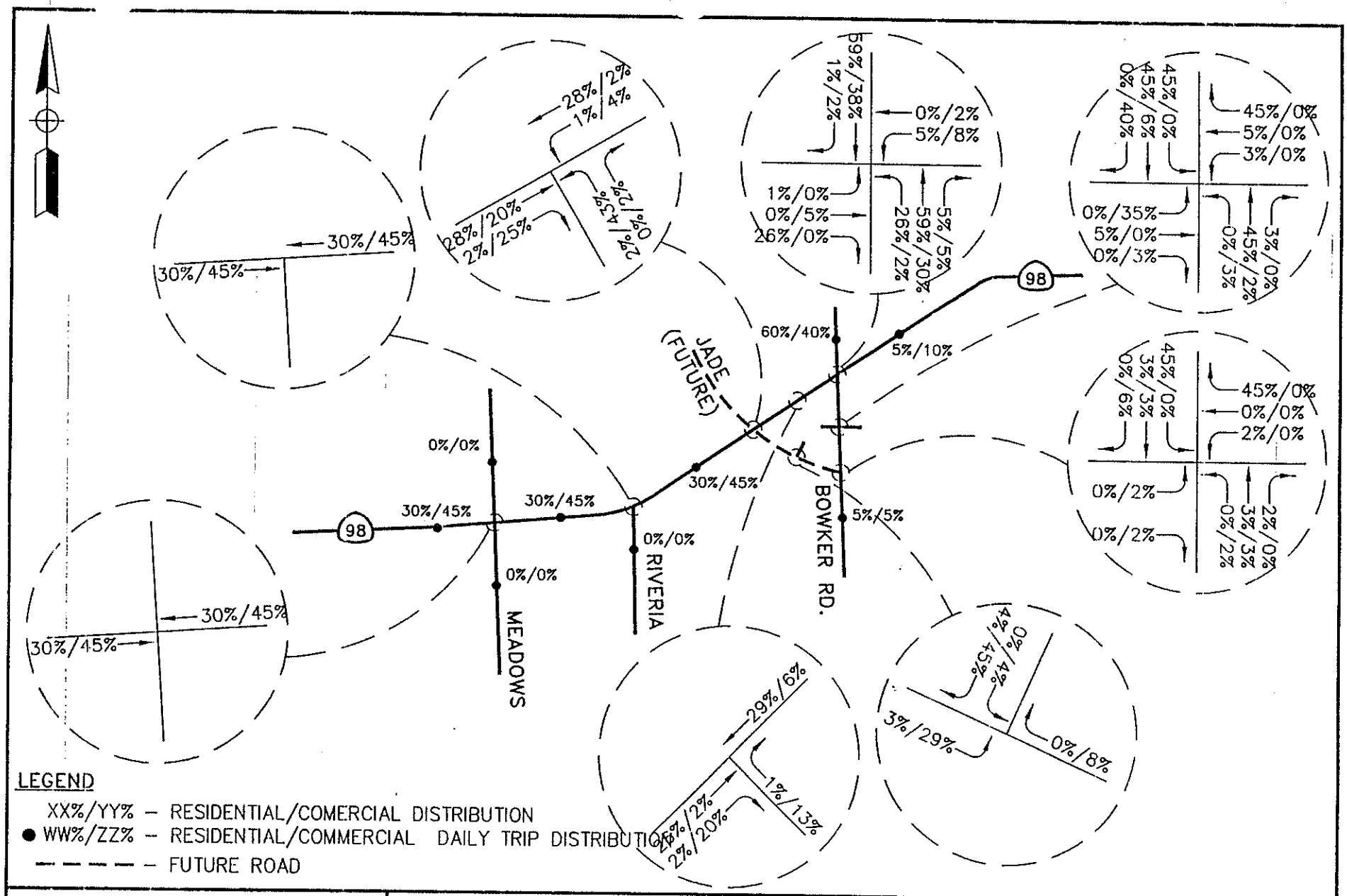
Trip Generation

Land Use	Total No. of Units	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Single Family Residential	249 DU	2,490	199	60	139	249	174	75
Commercial (Neighborhood)	138.259 ksf	16,591	664	398	266	1,659	830	829
Commercial (Neighborhood) with Pass By Reductions	138.259 ksf	7,798	312	187	125	995	498	497
Total w/o Pass-by Reduction		**19,081**	**863**	**458**	**405**	**1,908**	**1,004**	**904**
Total w/ Pass-by Reduction		**10,288**	**511**	**247**	**264**	**1,244**	**672**	**572**

Trip Generation Rates are based on rates published by SANDAG, April 2002
DU=Dwelling Unit; ksf=1,000 square feet

TRIP DISTRIBUTION/TRIP ASSIGNMENT

The trip distribution percentages for the project were based on the local and regional destinations for the trip purposes; i.e. the availability of shopping, schools, and employment. The project is being analyzed with two alternatives for project accesses into the commercial portion of the project. In Alternative 1, the project provides direct access to SR98 with a right in-right out only driveway. In Alternative 2, the commercial portion of the project does not have direct access to SR98. The trip distribution percentages for Alternative 1 and Alternative 2 are illustrated in Figures 5 and 6, respectively. The traffic generated by Alternative 1 and Alternative 2 were assigned to the roadways and intersections based on the trip distribution and are illustrated in Figures 7 and 8, respectively. The impacts associated with the addition of project traffic are discussed in the following section, Section IV.



LEGEND

XX%/YY% – RESIDENTIAL/COMERCIAL DISTRIBUTION

● WW%/ZZ% – RESIDENTIAL/COMMERCIAL DAILY TRIP DISTRIBUTION

– – – – – FUTURE ROAD

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FIGURE 5

TRIP DISTRIBUTION – ALTERNATIVE 1

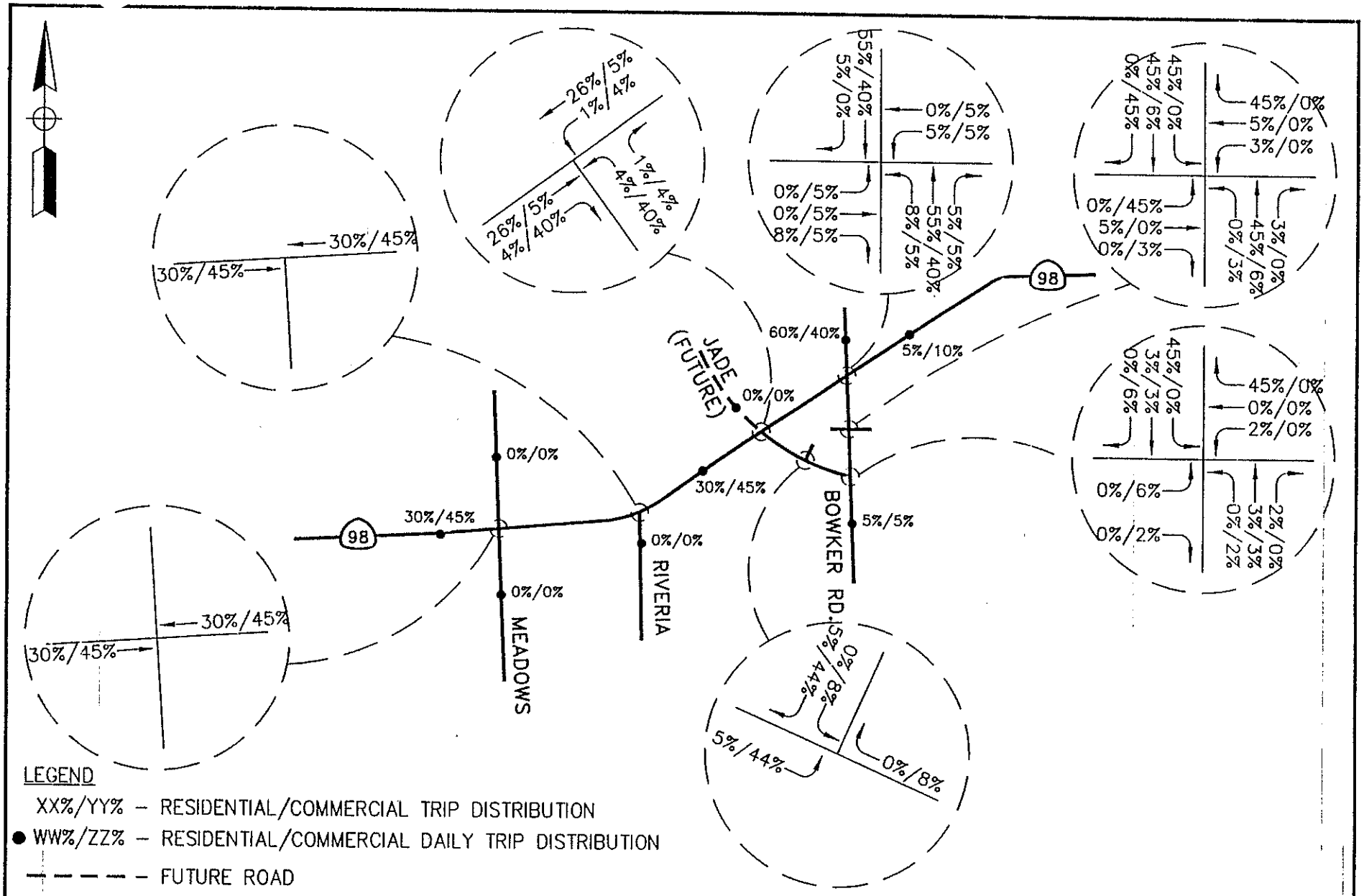

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FIGURE 6

TRIP DISTRIBUTION – ALTERNATIVE 2

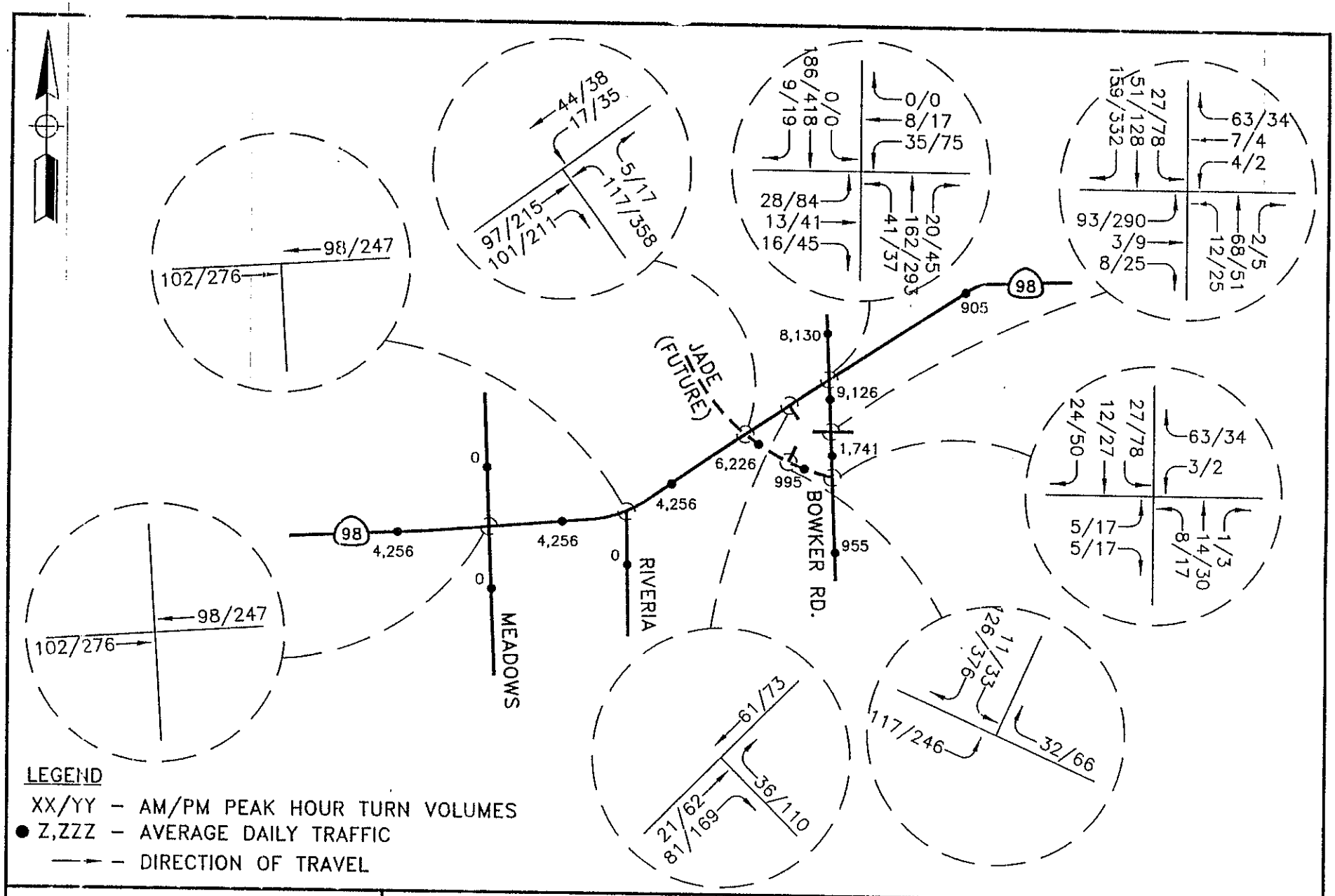

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FIGURE 7

PROJECT RELATED TRAFFIC VOLUMES – ALTERNATIVE 1

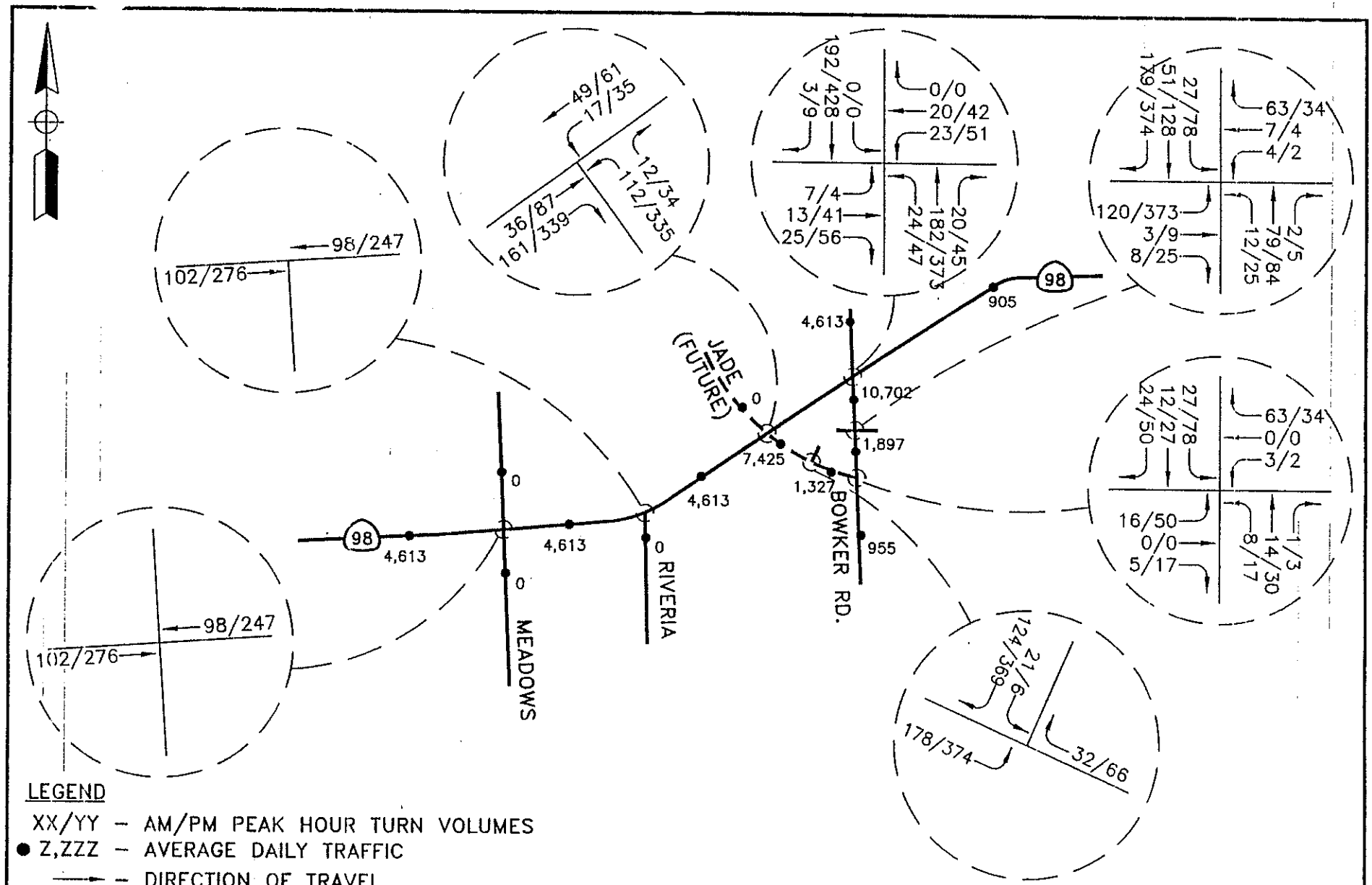

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FIGURE 8

PROJECT RELATED TRAFFIC VOLUMES – ALTERNATIVE 2

SHORT TERM

Meetings with Caltrans has identified the need to realign the SR98/Bowker road intersection in conjunction with the approval of the project. The realignment of the SR98/Bowker Road intersection will also require the preparation of a Caltrans Project Study Report/Project Report)PSR/PR) due to the anticipated cost of the realignments of the Imperial Irrigation District.

The City of Calexico has agreed to take the lead in preparation of the PSR/PR and administration of the construction contract for the realignment. This process is estimated to take 3-5 years to complete the improvements. To satisfy Caltrans concerns about the safety aspects at this intersection, we have identified a short term condition to allow development of the area south of SR98 to continue until such a time that the SR98 and Bowker Road intersection is realigned.

In the short term the southern leg of the intersection will be closed off. The closure of the southern leg will result in the proposed projects south of SR98 needing to utilize Jade Road to reach SR98. Figures 9 and 10 illustrate the new project distribution for each alternative. Figures 11 and 12 illustrate the project traffic. The impacts associated with the addition of project traffic are discussed in the following section, Section IV.

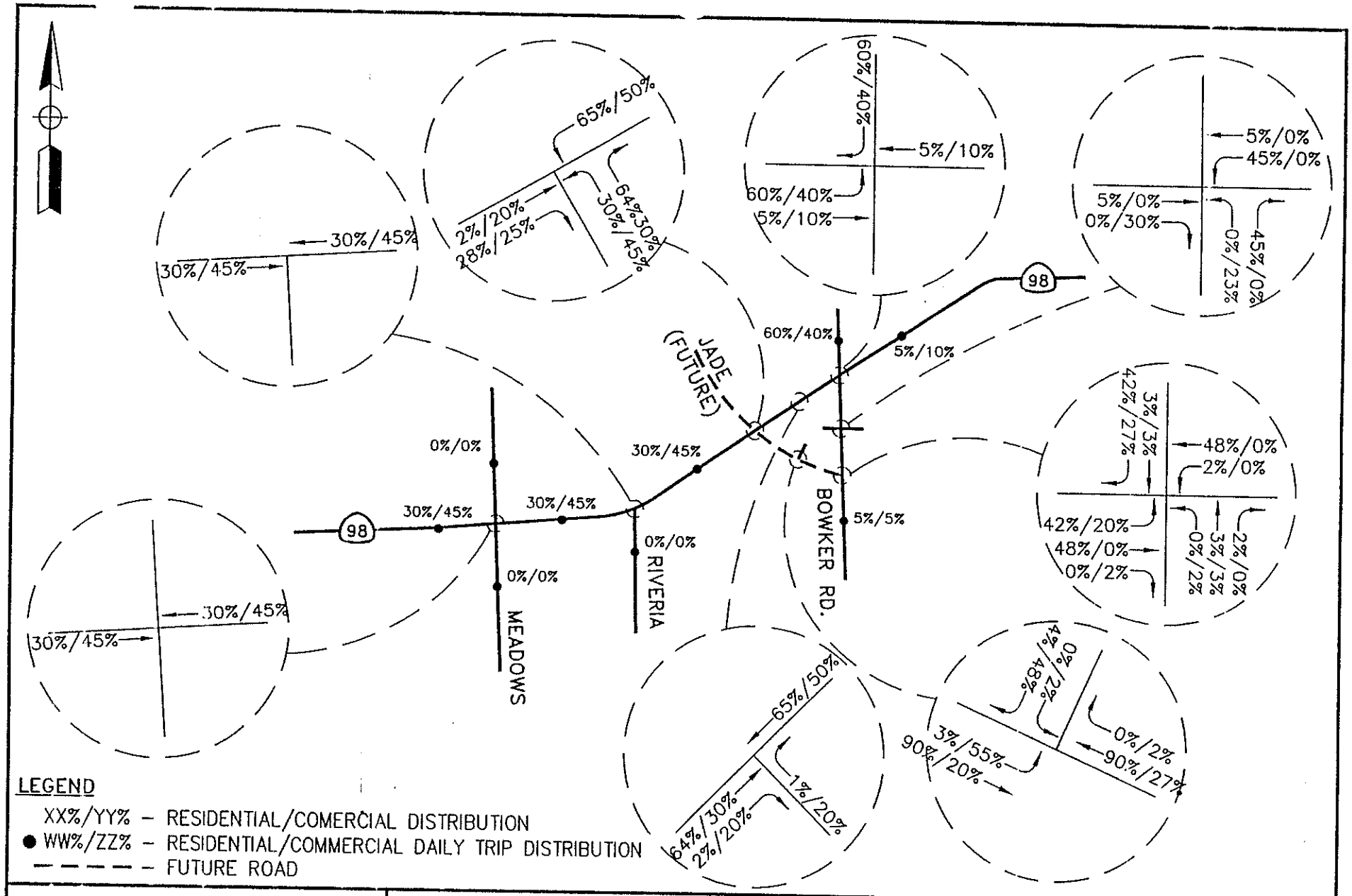

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FIGURE 9

SHORT TERM TRIP DISTRIBUTION – ALTERNATIVE 1

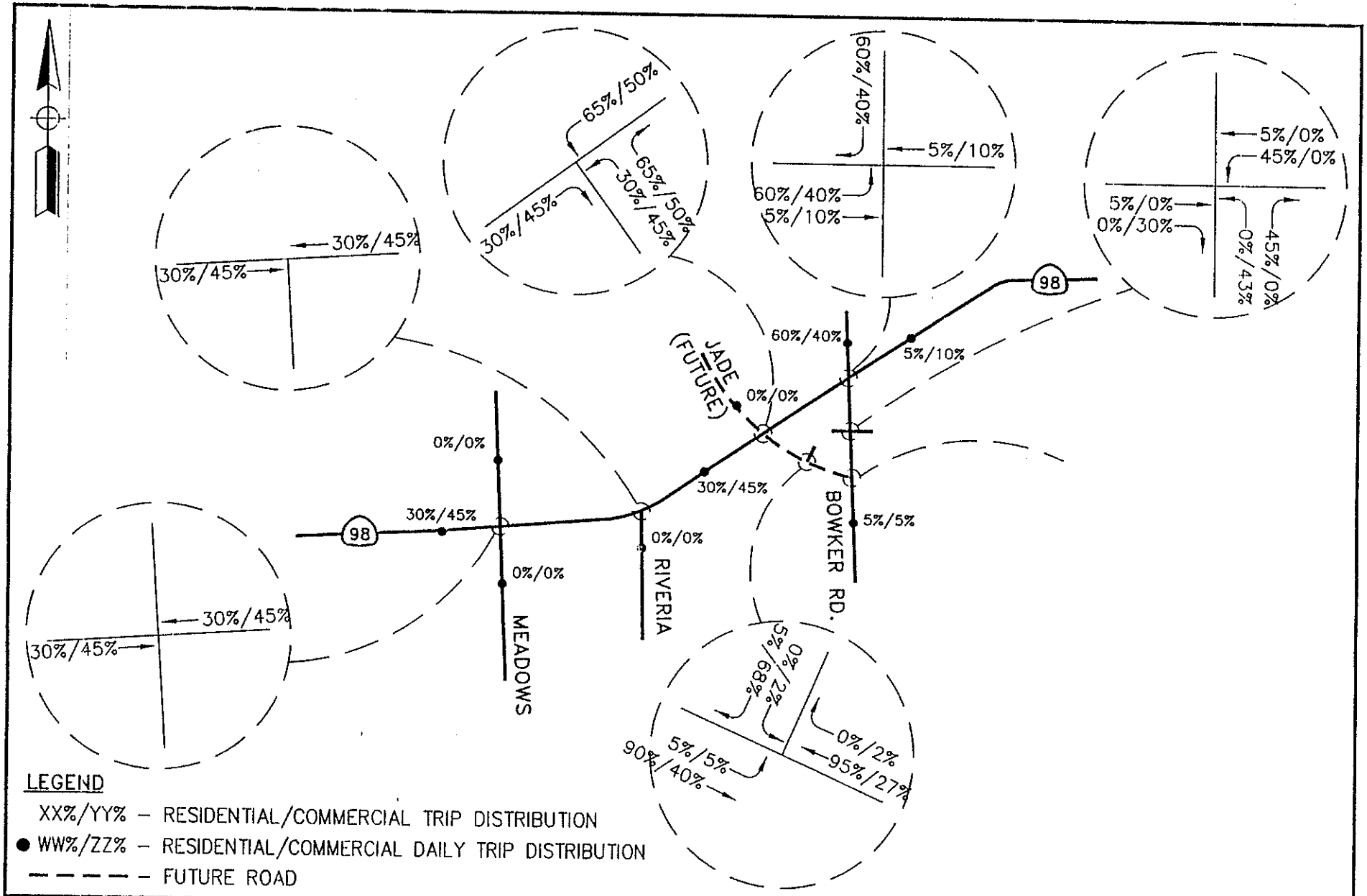

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FIGURE 10

SHORT TERM TRIP DISTRIBUTION – ALTERNATIVE 2

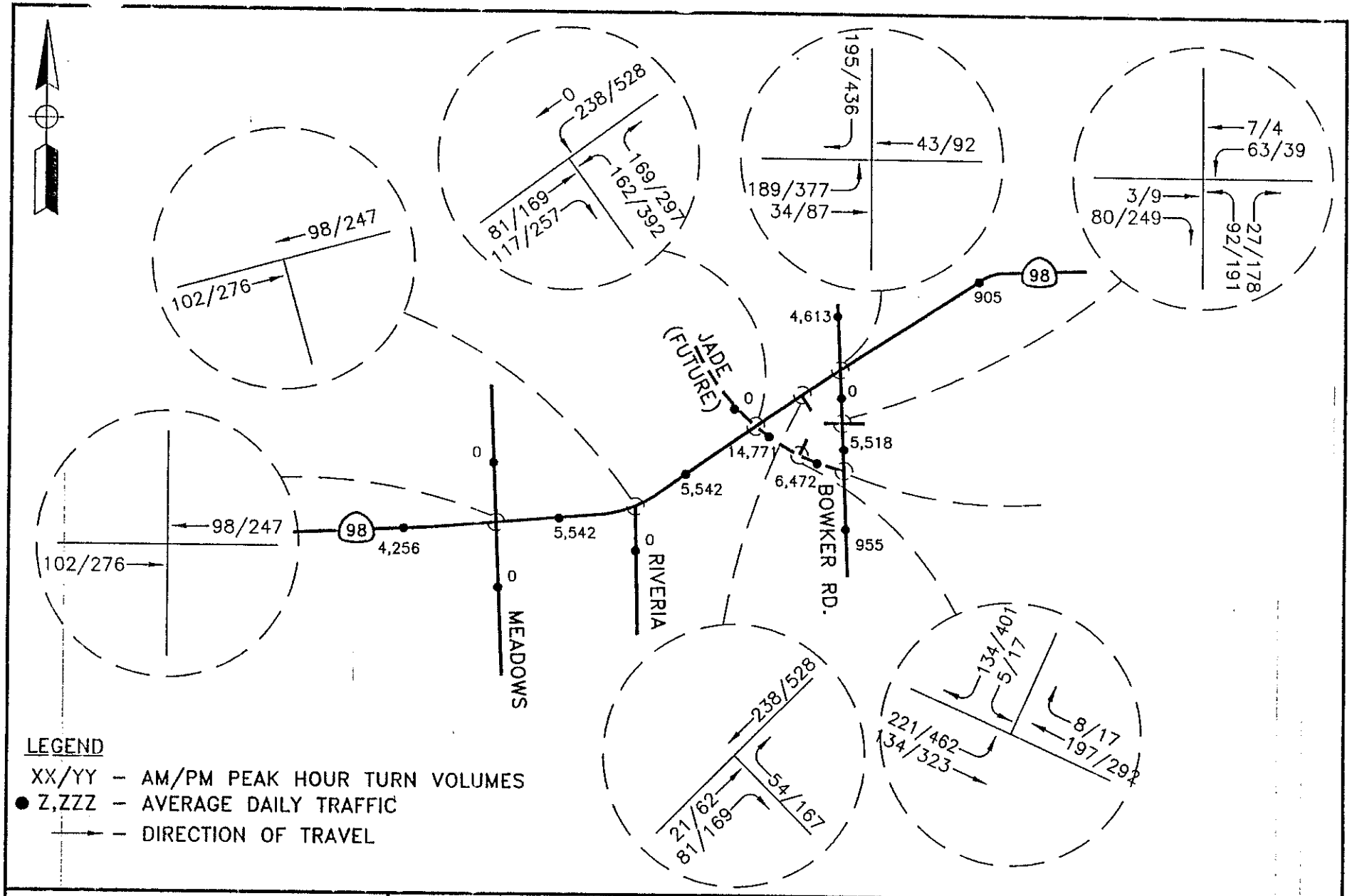

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FIGURE 11

SHORT TERM PROJECT RELATED TRAFFIC VOLUMES–ALTERNATIVE 1

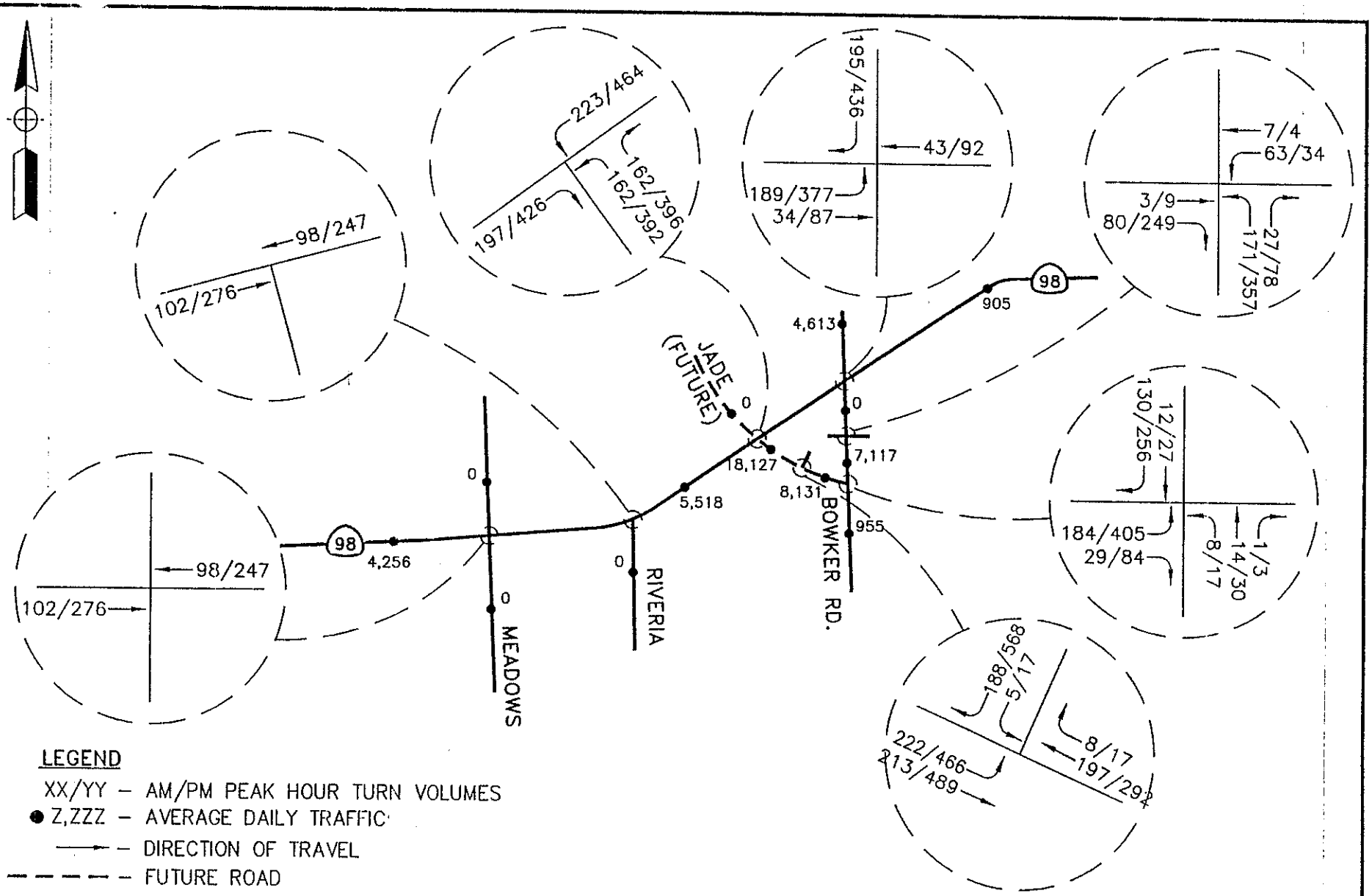

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FIGURE 12

SHORT TERM PROJECT RELATED TRAFFIC VOLUMES–ALTERNATIVE 2

SECTION IV – IMPACTS

LEVELS OF SIGNIFICANCE STANDARDS

Roadway Segments

If the project worsens the street segment LOS from LOS C or better to LOS D or worse, the project is considered to be significant. The only exception is if the street segment is operating at LOS D with the project traffic added and all of the intersections along the street segment operate at LOS D or better during peak periods, then the project is not considered to be significant. If the street segment LOS worsens from LOS D to LOS E or F, the impact is considered significant and direct. If the street segment LOS is already LOS E or LOS F without project traffic, the impact is considered to be cumulative.

Intersections

If the project traffic worsens the level of service at the study intersection from LOS C or better to LOS D or worse, the impact is considered to be significant. If the intersection LOS is already LOS D or worse and the project does not degrade the LOS, the impact is considered to be cumulative. If the project does degrade the LOS, the impact is considered direct.

EXISTING PLUS PROJECT CONDITIONS

The project traffic for each alternative was added to the existing traffic volumes. The daily and peak hour turn volumes for existing plus project conditions Alternative 1 and Alternative 2 are illustrated in Figures 13 and 14, respectively.

Roadway Segments

The roadway segments were analyzed with the traffic generated from the proposed project added to existing traffic volumes.

The roadway segments daily levels of service are summarized in Table 6 and the peak hour analysis for the road segments that act as highways are analyzed in Table 7. As can be seen in Table 6, with the addition of either project alternative's traffic, all roadway segments, with the exception of and Bowker Road between Cole Road and SR98 and Jade Road between SR98 and Bowker Road, will operate at LOS D or worse. As can be seen in Table 7, with the addition of project traffic all of the roadways that operate at LOS D or worse under daily conditions will continue to operate at LOS C or better during the peak hours. The project will have a significant impact on Bowker Road between SR98 and Jade Road for either alternative.

Intersections

The intersections were analyzed with the traffic generated from the proposed project added to existing traffic volumes. The intersections' levels of service for existing plus project conditions are summarized in Table 8, and the ILV analysis is summarized in Table 9. A copy of the Synchro and ILV analysis worksheets for existing plus project conditions can be found in Appendix D.

As can be seen in Table 8, with the addition of project Alternative 1 traffic, the SR98/Jade Road, SR98/Bowker Road, and Bowker Road/Project Access intersections will operate at LOS E or worse during at least one peak hour. With the addition of project Alternative 2 traffic, the SR98/Jade Road, SR98/Bowker Road, and Bowker Road/Project Access intersections will operate at LOS F during the PM peak hour. All other intersections operate at LOS C or better under existing plus project conditions (either alternative).

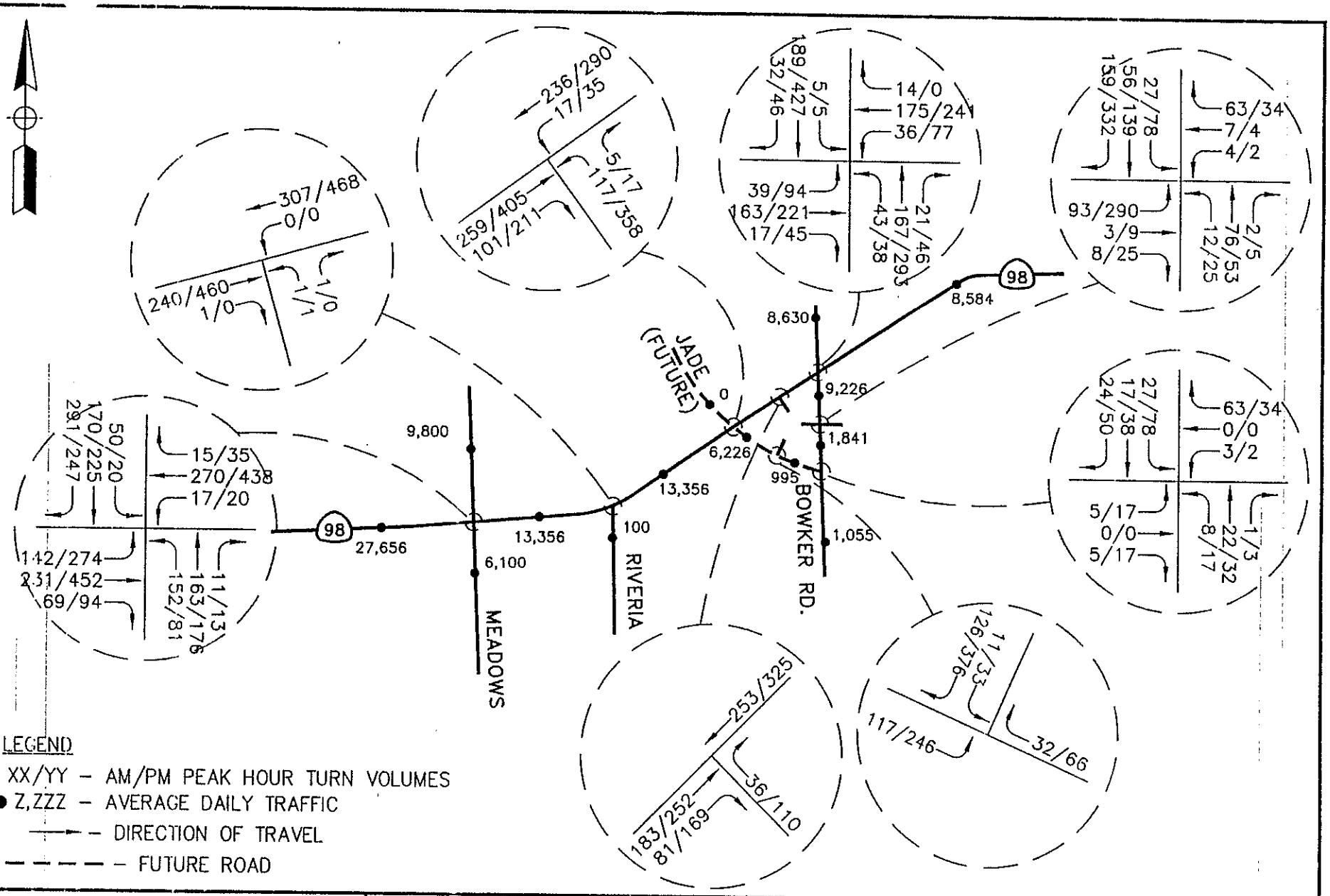

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FIGURE 13

EXISTING + PROJECT TRAFFIC VOLUMES ALTERNATIVE 1

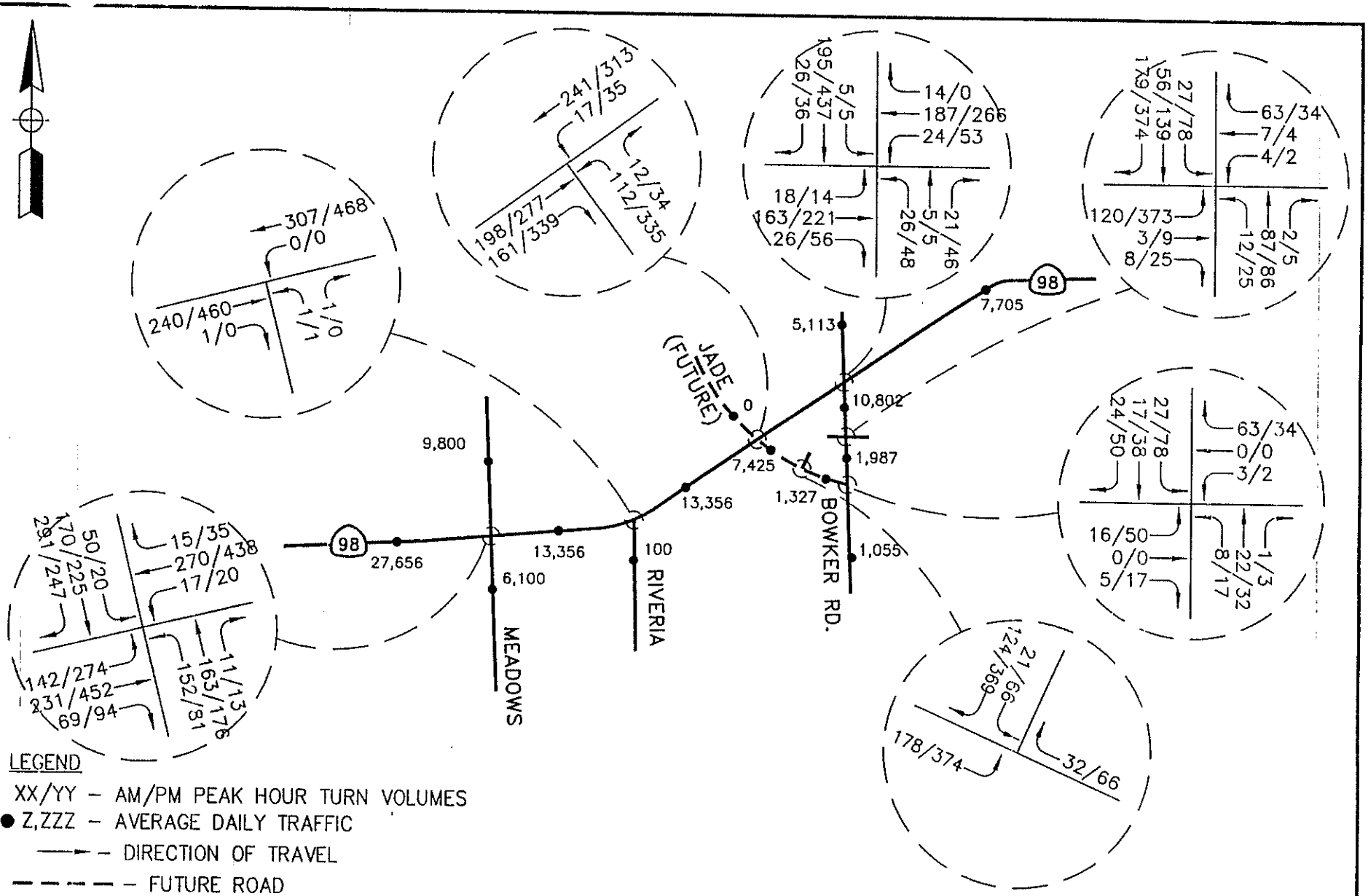

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FIGURE 14

EXISTING + PROJECT TRAFFIC VOLUMES ALTERNATIVE 2

Table 6 -Existing Plus Project Segment Daily Level of Service Summary

Alternative # 1

Roadway Segment	Class	Capacity[1]	Existing		Project Traffic ADT	Existing Plus Project		
			ADT	LOS		ADT	LOS	Significant [2]
SR98								
Rockwood To Meadows	SA	34,200	23,400	C	4,256	27,656	D	**No, See Table 7**
Meadows to Bowker	C	16,200	9,100	D	**4,256**	**13,356**	**E**	**No, See Table 7**
Bowker to Barbara Worth	C	16,200	6,800	C	905	7,705	D	**No, See Table 7**
Bowker								
Cole to SR98	C	16,200	500	A	8,130	5,113	C	N/A
South of SR98	C	16,200	100	A	**9,126**	**9,226**	**D**	**Yes**
Jade								
SR98 to Bowker	SA	34,200	N/A	N/A	6,226	6,226	A	N/A

Alternative # 2

Roadway Segment	Class	Capacity[1]	Existing		Project Traffic ADT	Existing Plus Project		
			ADT	LOS		ADT	LOS	Significant [2]
SR98								
Rockwood To Meadows	SA	34,200	23,400	C	**4,256**	**27,656**	**D**	**No, See Table 7**
Meadows to Bowker	C	34,200	9,100	C	**4,256**	**13,356**	**E**	**No, See Table 7**
Bowker to Barbara Worth	C	16,200	6,800	C	**905**	**7,705**	**D**	**No, See Table 7**
Bowker								
Cole to SR98	C	16,200	500	A	4,613	5,113	C	N/A
South of SR98	C	16,200	100	A	**10,702**	**10,802**	**D**	**Yes**
Jade								
SR98 to Bowker	SA	34,200	N/A	N/A	7,425	7,425	A	N/A

[1] Capacity is based on the upper limit of LOS E per the County of Imperial Level of Service Thresholds
[2] A project is considered to be significant if it worsens the street segment LOS from LOS C or better to LOS D or worse. The only exception is if the street segment operating at LOS D with project traffic added and all the intersections along the street segment operate at LOS D or better during peak periods, then the impact is not considered to be significant. If the street segment is already operating at LOS E or LOS F without the project traffic, the impact is considered to be cumulative.
ADT=Average Daily Traffic; LOS = Level of Service; C = Collector ; SA=Secondary Arterial

Table 7 -Existing Plus Project Segment Peak Hour Level of Service Summary

Multi Lane Roads

AM Peak

Roadway Segment	Direction	Existing		Existing + Project (Alternative 1)			Existing + Project (Alternative 2)		
		Density	LOS	Density	LOS	Δ Density	Density	LOS	Δ Density
SR98 Rockwood to Meadows/Andrade	EB	4.2	A	5.5	A	1.3	5.5	A	1.3
	WB	7.6	A	8.9	A	1.3	8.9	A	1.3

PM Peak

SR98 Rockwood to Meadows/Andrade	EB	6.8	A	10.2	A	3.4	10.2	A	3.4
	WB	6.4	A	9.5	A	3.1	9.5	A	3.1

Two Lane Roads

Roadway Segment	Segment Length	Existing			Existing Plus Project (alternative 1)					Existing Plus Project (alternative 2)				
		Avg Speed (mph)	Travel Time (sec)	LOS	Avg Speed (mph)	Travel Time (sec)	LOS	Δ Speed (mph)	Δ Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	LOS	Δ Speed (mph)	Δ Travel Time (sec)
AM Peak Hour														
SR98 Meadows to Bowker	1.0	59.5	60.5	A	58.2	61.9	B	(1.3)	1.4	58.5	61.5	B	2.0	1.0
Bowker to Barbara Worth	2.2	56.3	140.7	A	55.6	142.4	A	(0.7)	1.7	55.6	142.4	A	(0.7)	1.7
Bowker Cole to SR98	0.5	49.2	36.6	C	45.8	39.3	C	(3.4)	2.7	45.8	39.3	C	(3.4)	2.7
PM Peak Hour														
SR98 Meadows to Bowker	1.0	59.0	61.0	B	56.5	63.7	C	(2.5)	2.7	57.3	62.8	B	(1.7)	1.8
Bowker to Barbara Worth	2.2	55.6	142.4	A	54.2	146.1	B	(1.4)	3.7	54.2	146.1	B	(1.4)	3.7
Bowker Cole to SR98	0.5	49.3	36.5	C	42.4	42.5	D	(6.8)	6.0	42.4	42.5	D	(6.8)	6.0

Density is measured in passenger cars per mi per lane. LOS = Level of Service; Avg. Speed = Average Travel Speed in miles per hour (mph);
Travel Time = [Segment Length (miles) * 3600 seconds / hour] ÷ [Avg. Speed (mph)]Δ Speed = change in speed; Δ Travel Time = Change in Travel Time

Table 8 - Existing + Project Intersection Level of Service Summary

AM Peak Hour

Intersection	Critical Move	Existing		Existing + Alternative 1				Existing + Alternative 2			
		Delay[1]	LOS	Delay[1]	LOS	Δ Delay	Sign?[2]	Delay[1]	LOS	Δ Delay	Sign? [2]
SR98 @ Meadows/Andrade (Sig)	Int	16.0	B	16.9	B	0.9	N/A	18.9	B	0.9	N/A
SR98 @ Rivera (OWSC)	NB	9.9	A	11.2	B	1.3	N/A	11.2	B	1.3	N/A
SR98 @ Jade (TWSC)	WBL	-	-	8.1	A	-	N/A	8.1	A	-	N/A
	NB	-	-	18.3	C	-		16.8	C	-	
SR98 @ Project Access (OWSC)	NBR	-	-	9.8	A	-	N/A	-	-	-	N/A
SR98 @ Bowker (TWSC)	NB	11.4	B	**35.3**	**E**	23.9		24.8	C	13.4	N/A
	SB	10.0	B	23.4	C	13.4		20.8	C	10.8	
Jade @ Project Access	SB	-	-	9.2	A	-	N/A	9.8	A	-	N/A
Jade @ Bowker (TWSC)	EB	-	-	9.3	A	-	N/A	11.3	B	-	N/A
	WB	-	-	8.7	A	-		8.7	A	-	
Bowker @ Project Access (TWSC)	EB	-	-	13.6	B	-	N/A	14.8	B	-	N/A
	WB	-	-	9.5	A	-		9.6	A	-	

PM Peak Hour

Intersection	Critical Move	Existing		Existing + Alternative 1				Existing + Alternative 2			
		Delay	LOS	Delay	LOS	Δ Delay	Sign?	Delay	LOS	Δ Delay	Sign?
SR98 @ Meadows/Andrade (Sig)	Int	16.3	B	19.1	B	2.8	n/a	19.1	B	2.8	n/a
SR98 @ Rivera (OWSC)	NB	11.3	B	18.6	C	7.3	n/a	18.6	C	15.0	n/a
SR98 @ Jade (TWSC)	WBL	-	-	9.1	A	-	YES	9.1	A	-	YES
	NB	-	-	**338.6**	**F**	-		**238.9**	**F**	-	
SR98 @ Project Access (OWSC)	NBR	-	-	11.4	B	-	N/A	-	-	-	N/A
SR98 @ Bowker (TWSC)	NB	11.1	B	**>999**	**F**		YES	**>999**	**F**	-	YES
	SB	10.9	B	**>999**	**F**	-		**>999**	**F**	-	
Jade @ Project Access	SB	-	-	12.8	B	-	N/A	23.0	C	-	N/A
Jade @ Bowker (TWSC)	EB	-	-	10.2	B	-	N/A	11.3	B	-	N/A
	WB			8.7	A			8.7	A		
Bowker @ Project Access (TWSC)	EB	-	-	**81.0**	**F**	-	YES	**222.3**	**F**	-	YES
	WB	-	-	10.1	B	-		10.5	B	-	

[1] measured in seconds/vehicle,
[2] significance only applies to LOS E or worse when the change in delay is greater than 2 seconds
Crit. Mov. = Critical Movement; LOS = Level of Service; Sig. = Signalized; Sign? =Significant; OWSC = One-Way Stop-Controlled; TWSC= Two Way Stop Controlled, EB= Eastbound; WB=Westbound; NB=Northbound; NBR=Northbound Right; SB= Southbound; Int = Intersection. N/A=Not Applicable

Table 9 – Existing + Project ILV Summary

Intersection	Alternative	AM Peak Hour		PM Peak Hour	
		ILV/Hour	Operating Condition	ILV/Hour	Operating Condition
SR98@ Meadows/Andrade	1	578	Stable Flow	557	Stable Flow
	2	578	Stable Flow	557	Stable Flow

ILV=Intersecting Lane Volumes
<1200 ILV/hour = Stable Flow
1200 – 1500 ILV/hour = Unstable Flow
1500 ILV/hour = Capacity – Heavy Congestion

As can be seen in Table 9, the SR98/Meadows Road intersection continues to operate under Stable Flow for either alternative.

SHORT TERM

The roadway network was reanalyzed with the closure of the southern leg of the SR98/Bowker Road intersection. Since the closure also affects the CM Ranch project, located just south of the Venezia project, the traffic from this project was also included in the analysis. The phase 1 traffic volumes from the CM Ranch project were added on to the existing traffic volumes to obtain the short term Existing Plus CM Ranch traffic volumes and are shown in Figure 15. The project traffic for each alternative was added to these volumes to obtain the short term traffic volumes. Figures 16 and 17 illustrate the short term traffic volumes.

Roadway Segments

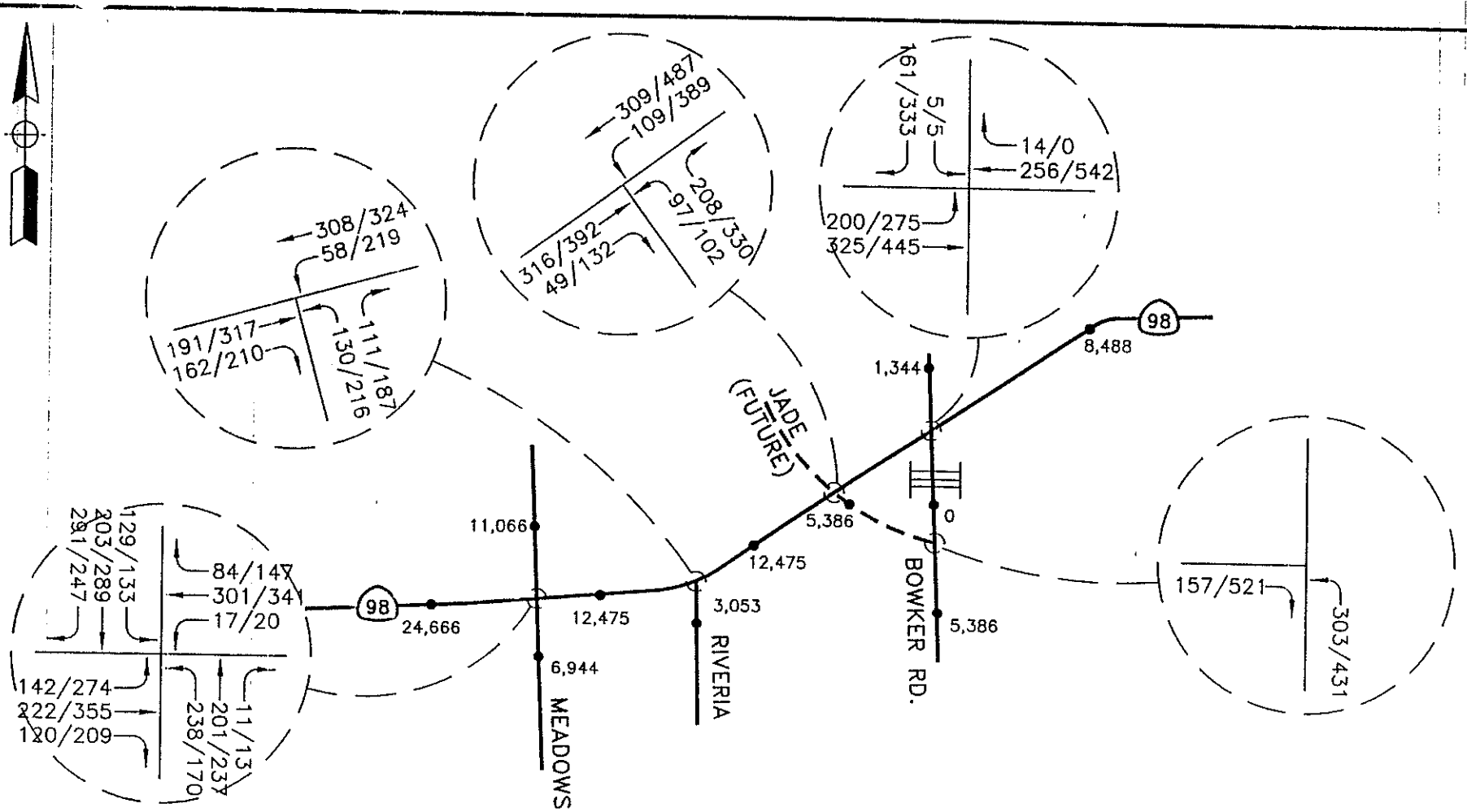
The roadway segments were analyzed with the traffic generated from the proposed project added to existing plus CM Ranch traffic volumes.

The roadway segments daily levels of service are summarized in Table 10 and the peak hour analysis for the road segments that act as highways are analyzed in Table 11. As can be seen in Table 10, under Existing plus CM Ranch conditions, SR98 between Meadows Road and Barbara Worth Road operates at LOS D or worse. With the addition of either project alternative's traffic, SR98 between Rockwood Avenue and Barbara Worth will operate at LOS D or worse. As can be seen in Table 11, with the addition of project traffic all of the roadways that operate at LOS D or worse under daily conditions will operate at LOS D or better during the peak hours. The project is not considered to have an impact on these segments due to operating at LOS D during the peak hours. All other roadway segments operate at LOS C or better.

Intersections

The intersections were analyzed with the traffic generated from the proposed project added to existing plus CM Ranch traffic volumes. The intersections' levels of service are summarized in Table 12, and the ILV analysis is summarized in Table 13. A copy of the Synchro and ILV analysis worksheets for existing plus CM Ranch and Short Term conditions can be found in Appendix D and E, respectively.

As can be seen in Table 12, under existing plus CM Ranch conditions, the SR98/Bower Road, SR98/Jade Road, and SR98/Bowker Road intersections will all operate at LOS E or worse during at least one peak hours. With the addition of project Alternative 1 traffic, the SR98/Project Access and the Jade Road/Project access intersections will operate at LOS F during the PM peak hour. With the addition of project Alternative 2 traffic, the Jade Road/Project Access intersection will also operate at LOS E or worse during both peak hours. All other intersections operate at LOS C or better under existing plus project conditions (either alternative). The project is considered to have a significant impact at all of the previously mentioned intersections that operate at LOS E or worse.



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

→ – DIRECTION OF TRAVEL

– BARRICADED ROAD

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FIGURE 15

EXISTING + CM RANCH TRAFFIC VOLUMES

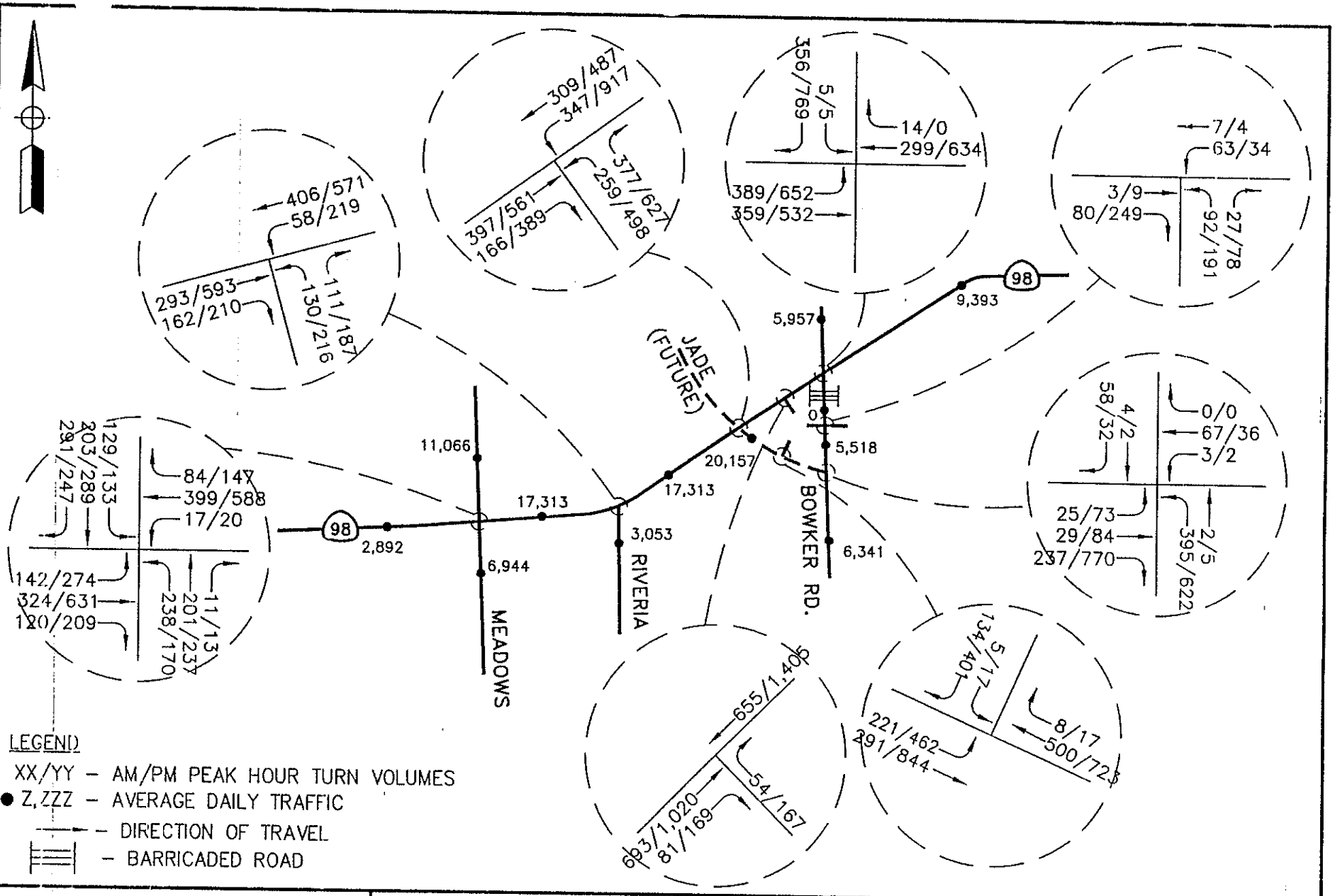

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FIGURE 16

SHORT TERM TRAFFIC VOLUMES–ALTERNATIVE 1

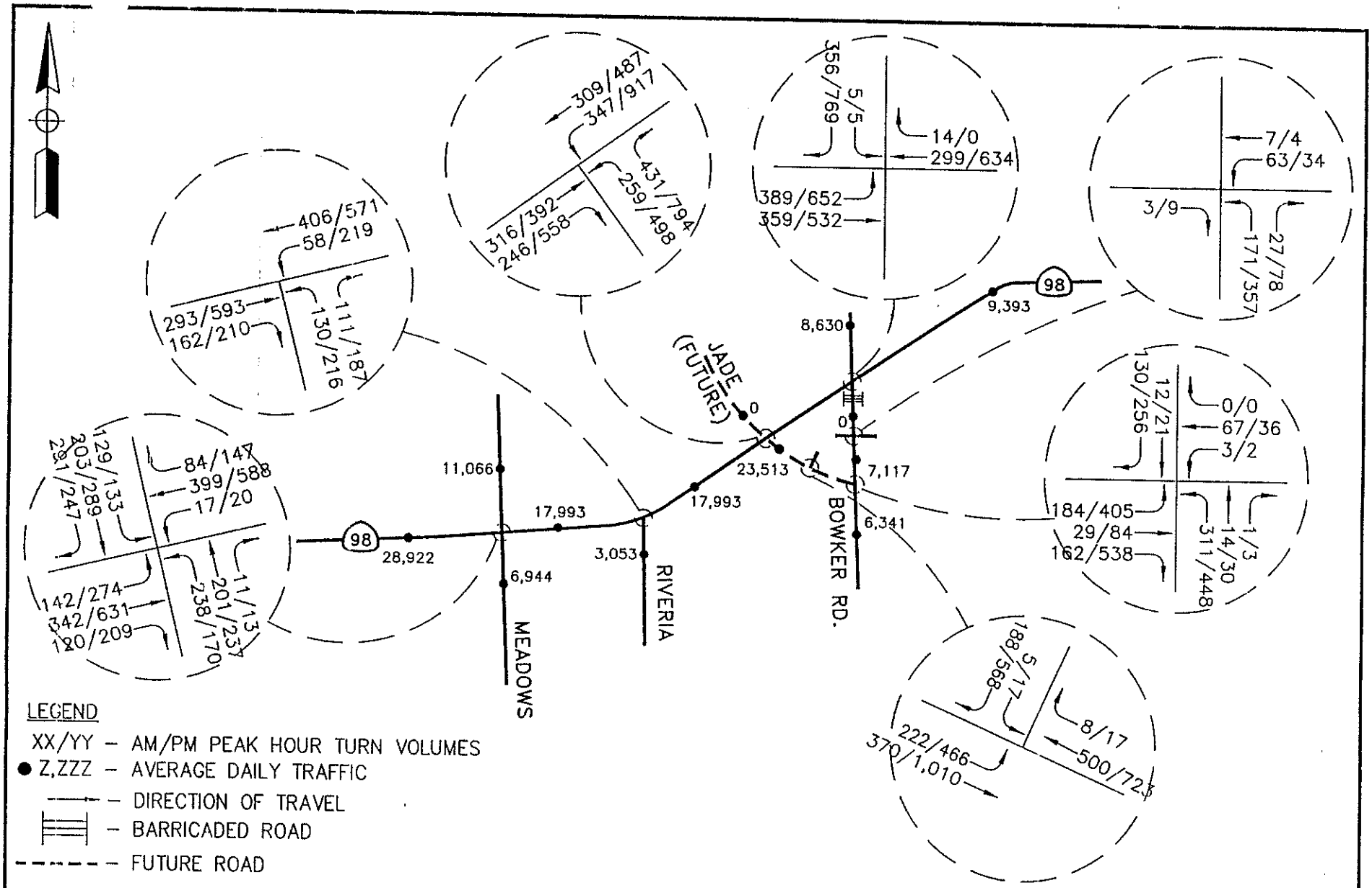

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FIGURE 17

SHORT TERM TRAFFIC VOLUMES–ALTERNATIVE 2

Table 10 –Short Term Segment Daily Level of Service Summary

Alternative # 1

Roadway Segment	Class	Capacity[1]	Existing + CM Ranch		Project Traffic ADT	Short Term		
			ADT	LOS		ADT	LOS	Significant [2]
SR98								
Rockwood To Meadows	SA	34,200	24,666	C	**4,256**	**28,922**	**D**	**No, See Table 11**
Meadows to Bowker	C	**16,200**	**12,475**	**E**	**5,542**	**18,017**	**F**	**No, See Table 11**
Bowker to Barbara Worth	C	**16,200**	**8,488**	**D**	**905**	**9,393**	**D**	**No, See Table 11**
Bowker								
Cole to SR98	C	16,200	1,344	A	4,613	5,957	C	N/A
South of SR98	C	16,200	0	-	0	0	-	N/A
Jade								
North of SR98	SA	34,200	1,251	A	0	1,251	A	N/A
SR98 to Bowker	SA	34,200	5,386	A	14,771	20,157	B	N/A

Alternative # 2

Roadway Segment	Class	Capacity[1]	Existing + CM Ranch		Project Traffic ADT	Short Term		
			ADT	LOS		ADT	LOS	Significant [2]
SR98								
Rockwood To Meadows	SA	34,200	24,666	C	**4,256**	**28,922**	**D**	**No, See Table 11**
Meadows to Bowker	C	**34,200**	**12,475**	**E**	**5,518**	**17,993**	**F**	**No, See Table 11**
Bowker to Barbara Worth	C	**16,200**	**8,488**	**D**	**905**	**9,393**	**D**	**No, See Table 11**
Bowker								
Cole to SR98	C	16,200	1,344	A	4,613	5,957	C	N/A
South of SR98	C	16,200	0	-	0	0	-	N/A
Jade								
North of SR98	SA	34,200	1,251	A	0	1,251	A	N/A
SR98 to Bowker	SA	34,200	5,386	A	18,127	23,513	C	N/A

[1] Capacity is based on the upper limit of LOS E per the County of Imperial Level of Service Thresholds
[2]A project is considered to be significant if it worsens the street segment LOS from LOS C or better to LOS D or worse. The only exception is if the street segment operating at LOS D with project traffic added and all the intersections along the street segment operate at LOS D or better during peak periods, then the impact is not considered to be significant. If the street segment is already operating at LOS E or LOS F without the project traffic, the impact is considered to be cumulative.
ADT=Average Daily Traffic; LOS = Level of Service; C = Collector ; SA=Secondary Arterial

Table 11 –Short Term Segment Peak Hour Level of Service Summary														
Multi Lane Roads														
AM Peak														
Roadway Segment	**Direction**	**Existing + CM Ranch**		**Short Term (Alternative 1)**			**Short Term (Alternative 2)**							
		Density	**LOS**	**Density**	**LOS**	**Δ Density**	**Density**	**LOS**	**Δ Density**					
SR98 Rockwood to Meadows/Andrade	EB	6.0	A	7.3	A	1.3	7.3	A	1.3					
	WB	10.3	A	11.5	B	1.2	11.5	B	1.2					
PM Peak														
SR98 Rockwood to Meadows/Andrade	EB	10.4	A	13.8	B	3.4	13.8	B	3.4					
	WB	9.4	A	12.5	B	3.1	12.5	B	3.1					
Two Lane Roads														
Roadway Segment	**Segment Length**	**Existing + CM Ranch**			**Short Term (Alternative 1)**					**Short Term (Alternative 2)**				
		Avg Speed (mph)	**Travel Time (sec)**	**LOS**	**Avg Speed (mph)**	**Travel Time (sec)**	**LOS**	**Δ Speed (mph)**	**Δ Travel Time (sec)**	**Avg Speed (mph)**	**Travel Time (sec)**	**LOS**	**Δ Speed (mph)**	**Δ Travel Time (sec)**
AM Peak Hour														
SR98 Meadows to Bowker	1.0	56.5	63.7	C	52.4	68.7	D	(4.1)	5.0	52.6	68.4	D	(3.9)	4.7
Bowker to Barbara Worth	2.2	56.3	140.7	A	56.0	141.4	A	(0.3)	0.7	56.0	141.4	A	(0.3)	0.7
Bowker Cole to SR98	0.5	46.4	38.5	C	43.2	41.7	D	(3.2)	3.2	43.2	41.7	D	(3.2)	3.2
PM Peak Hour														
SR98 Meadows to Bowker	1.0	54.4	66.2	C	46.0	78.3	E	(8.4)	12.1	46.0	78.3	E	(8.4)	12.1
Bowker to Barbara Worth	2.2	55.3	143.2	B	54.7	144.8	B	(0.6)	1.6	54.7	144.8	B	(0.6)	1.6
Bowker Cole to SR98	0.5	44.5	40.4	D	**37.6**	**47.9**	**E**	**(6.9)**	**7.5**	**37.6**	**47.9**	**E**	**(6.9)**	**7.5**

Density is measured in passenger cars per mi per lane. LOS = Level of Service; Avg. Speed = Average Travel Speed in miles per hour (mph);
Travel Time = [Segment Length (miles) * 3600 seconds / hour] ÷ [Avg. Speed (mph)]Δ Speed = change in speed; Δ Travel Time = Change in Travel Time

Table 12 – Short Term Intersection Level of Service Summary

AM Peak Hour

Intersection	Critical Move	Existing + CM Ranch		Short Term - Alternative 1				Short Term Alternative 2			
		Delay[1]	LOS	Delay[1]	LOS	Δ Delay	Sign?[2]	Delay[1]	LOS	Δ Delay	Sign? [2]
SR98 @ Meadows/Andrade (Sig)	Int	20.4	C	21.8	C	1.4	N/A	21.8	C	1.4	N/A
SR98 @ Rivera (OWSC)	NB	22.0	C	**37.2**	**E**	**15.2**	**YES**	**37.2**	**E**	15.2	**YES**
SR98 @ Jade (TWSC)	WBL NB	8.5 19.9	A C	11.1 **>999**	B **F**	2.6 -	**YES**	11.1 **>999**	B **F**	2.6 -	**YES**
SR98 @ Project Access (OWSC)	NBR	-	-	16.0	C	-	N/A	-	-	-	N/A
SR98 @ Bowker (TWSC)	NB SB	- 12.1	- B	- 20.0	- C	- 7.9	N/A	- 20.0	- C		N/A
Jade @ Project Access	SB	-	-	12.6	B	-	N/A	13.3	B		N/A
Jade @ Bowker (TWSC)	EB WB	25.6 -	D -	15.5 **35.0**	C **E**	(10.1) -	**YES**	**75.6** 28.0	**F** D	**50.0** -	**YES**
Bowker @ Project Access (TWSC)	EB WB	- -	- -	8.7 12.2	A B	- -	N/A	8.8 15.4	A C		N/A

PM Peak Hour

Intersection	Critical Move	Existing + CM Ranch		Short Term - Alternative 1				Short Term Alternative 2			
		Delay	LOS	Delay	LOS	Δ Delay	Sign?	Delay	LOS	Δ Delay	Sign?
SR98 @ Meadows/Andrade (Sig)	Int	20.7	C	23.6	C	2.9	N/A	23.6	C	2.9	N/A
SR98 @ Rivera (OWSC)	NB	**519.8**	**F**	**>999**	**F**	-	**YES**	**>999**	**F**	-	**YES**
SR98 @ Jade (TWSC)	WBL NB	11.2 **>999**	B **F**	**158.2** **>999**	**F** **F**	7.0 -	**YES**	**158.2** **>999**	**F** **F**	7.0 -	**YES**
SR98 @ Project Access (OWSC)	NBR	-	-	**65.0**	**F**	-	**YES**	-	-	-	N/A
SR98 @ Bowker (TWSC)	NB SB	- **38.2**	- **E**	- **>999**	- **F**	- -	**YES**	- **914.4**	- **F**	- **876.2**	**YES**
Jade @ Project Access	SB	-	-	**>999**	**F**	-	**YES**	**796.6**	**F**	-	**YES**
Jade @ Bowker (TWSC)	EB	11.9	B	**467.4** **>999**	**F** **F**	**455.5** -	**YES**	**>999** **99.8**	**F** **F**	- -	**YES**
Bowker @ Project Access (TWSC)	EB WB	- -	- -	9.8 23.5	A C	- -	N/A	10.3 **50.0**	B **E**	- -	**YES**

[1] measured in seconds/vehicle,
[2] significance only applies to LOS E or worse when the change in delay is greater than 2 seconds
Crit. Mov. = Critical Movement; LOS = Level of Service; Sig. = Signalized; Sign? =Significant; OWSC = One-Way Stop-Controlled; TWSC= Two Way Stop Controlled, EB= Eastbound; WB=Westbound; NB=Northbound; NBR=Northbound Right; SB= Southbound; Int = Intersection. N/A=Not Applicable

Table 13 – Short Term ILV Summary									
Intersection	Existing Plus CM Ranch				Short Term				
	AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour	
	ILV/Hour	Operating Condition	ILV/Hour	Operating Condition	Alt	ILV/Hour	Operating Condition	ILV/Hour	Operating Condition
SR98@ Meadows/Andrade	680	Stable Flow	630	Stable Flow	1	729	Stable Flow	768	Stable Flow
					2	729	Stable Flow	768	Stable Flow

ILV=Intersecting Lane Volumes
<1200 ILV/hour = Stable Flow
1200 – 1500 ILV/hour = Unstable Flow
1500 ILV/hour = Capacity – Heavy Congestion

EXISTING PLUS OTHERS

Approved/Pending Projects

Through research in the area, it was found that there were 29 other approved/pending projects in the area that would directly impact the same roadways as this project. Project descriptions and trip generation can be found in Appendix B.

Cumulative Approved/Pending Projects Traffic

The combined traffic generated by the other known projects is approximately 124,625 average daily trips (ADTs), 9,403 AM peak hour trips, and 14,650 PM peak hour trips. Figure 18 illustrates the other approved pending project traffic. The existing plus other approved/pending project traffic volumes are illustrated in Figure 19.

NEAR TERM CUMULATIVE CONDITIONS

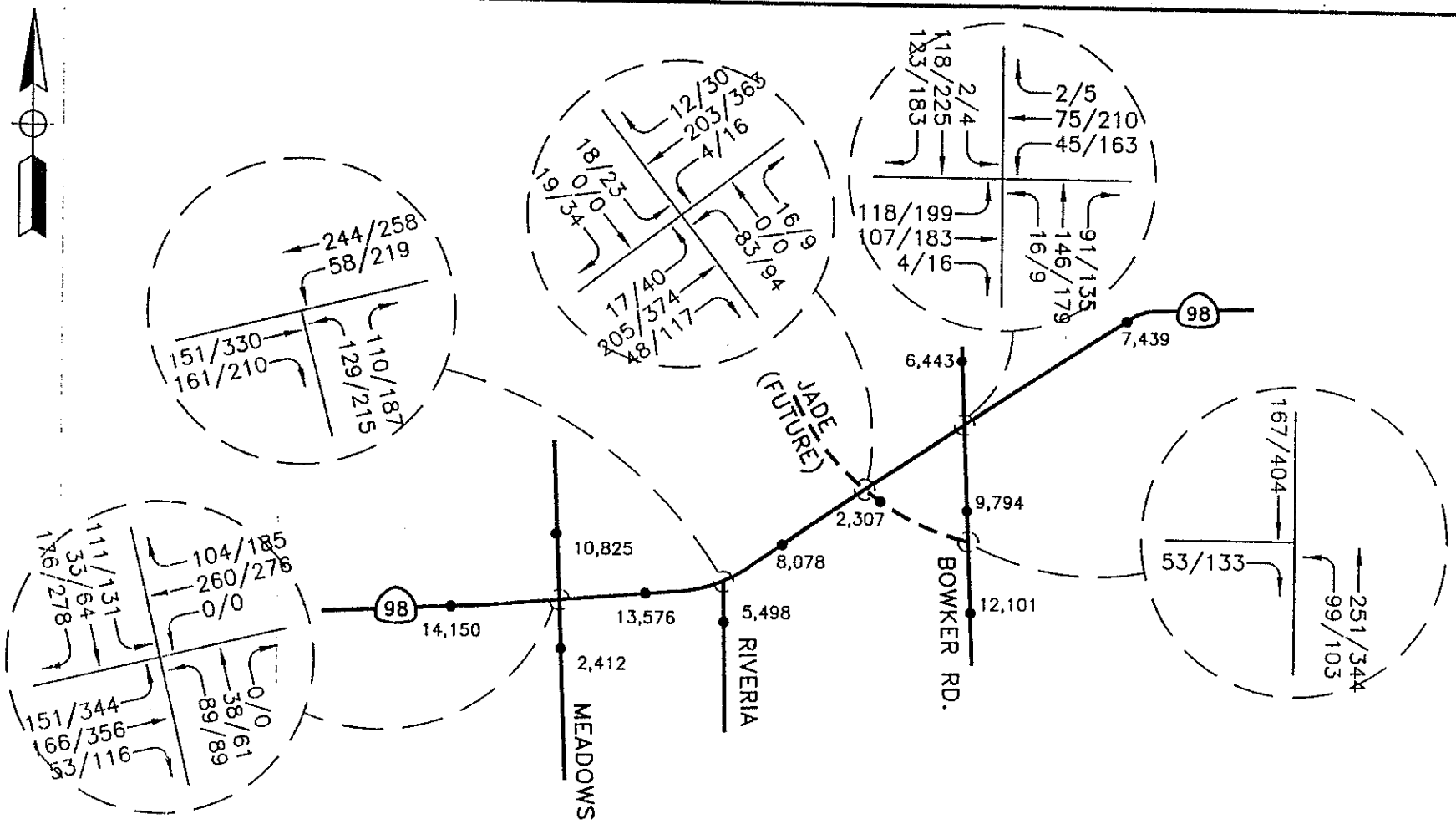
The project traffic was added to the existing plus other approved/pending projects to obtain the near term cumulative traffic volumes. The daily and peak hour turn volumes for near term cumulative conditions are illustrated in Figure 20.

Roadway Segments

The roadway segments daily levels of service for the existing plus others projects and near term cumulative conditions are summarized in Table 14, and the peak hour analysis is summarized in Table 15.

As can be seen in Table 14, for either project alternative under daily level of service analysis all roadway segments, except Jade Road, operate at LOS E or worse for the near term conditions. As can be seen in Table 15, under peak hour conditions, for either project alternative, SR98 between Rockwood Lane and Meadows Road will operate at LOS C or better. SR98 between Meadows Road and Bowker Road operates at LOS D during the AM peak hour for either alternative, during the PM peak hour; it will operate at LOS E for either alternative. SR98 between Bowker Road and Barbara Worth will operate at LOS D during the AM peak hour and at LOS E during the PM peak hour for both alternatives. Bowker Road between Cole Road and SR98 will operate at LOS D during the AM peak hour and LOS E during the PM peak hour for both alternatives.

The project will have a significant cumulative impact on SR98 between Meadows Road and Bowker Road and on Bowker Road between Cole Road and Jade Road for both project alternatives.



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

——→ – DIRECTION OF TRAVEL

- - - - - - FUTURE ROAD

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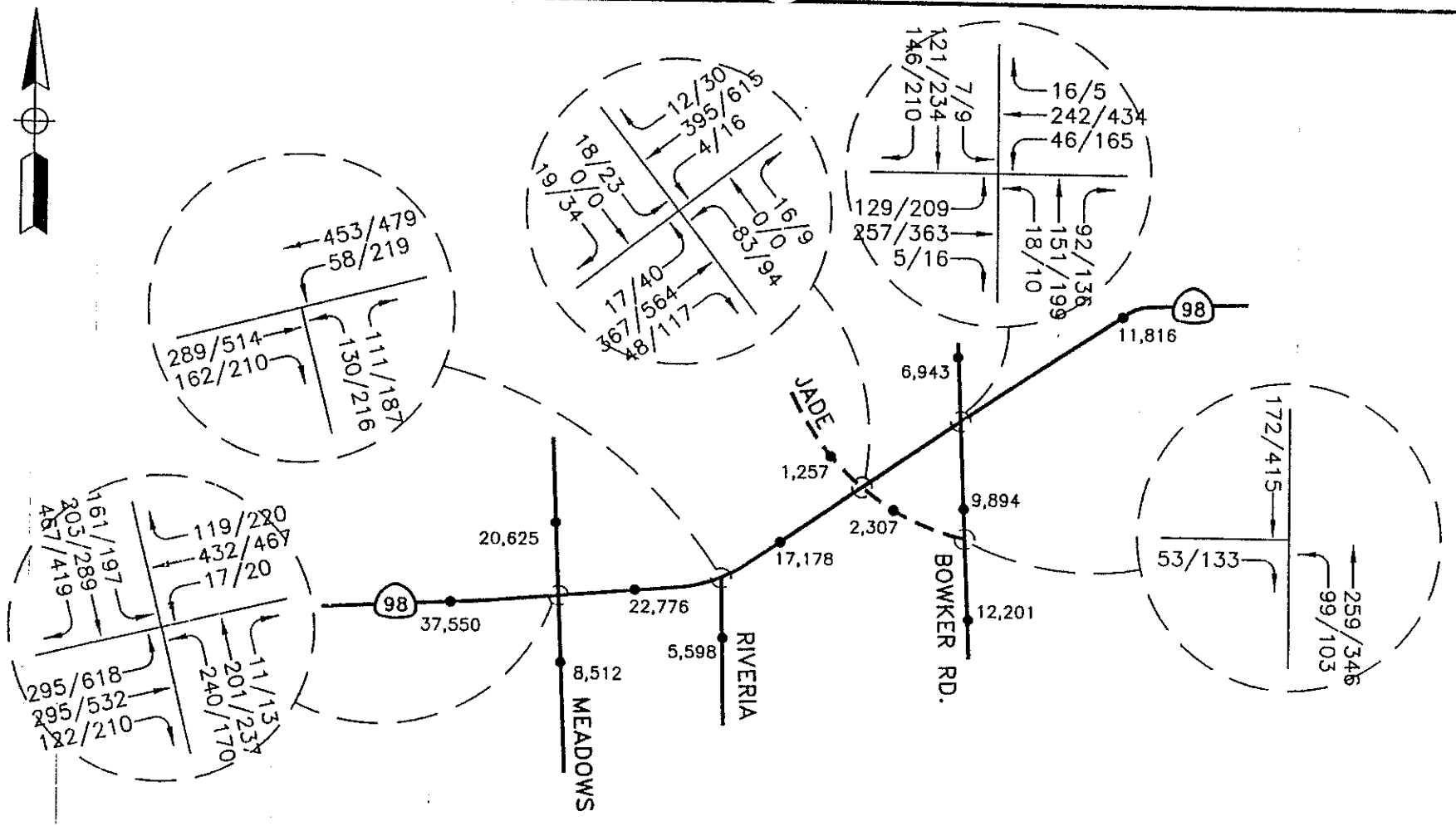
FIGURE 18

OTHER PROJECTS TRAFFIC VOLUMES



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

→ – DIRECTION OF TRAVEL

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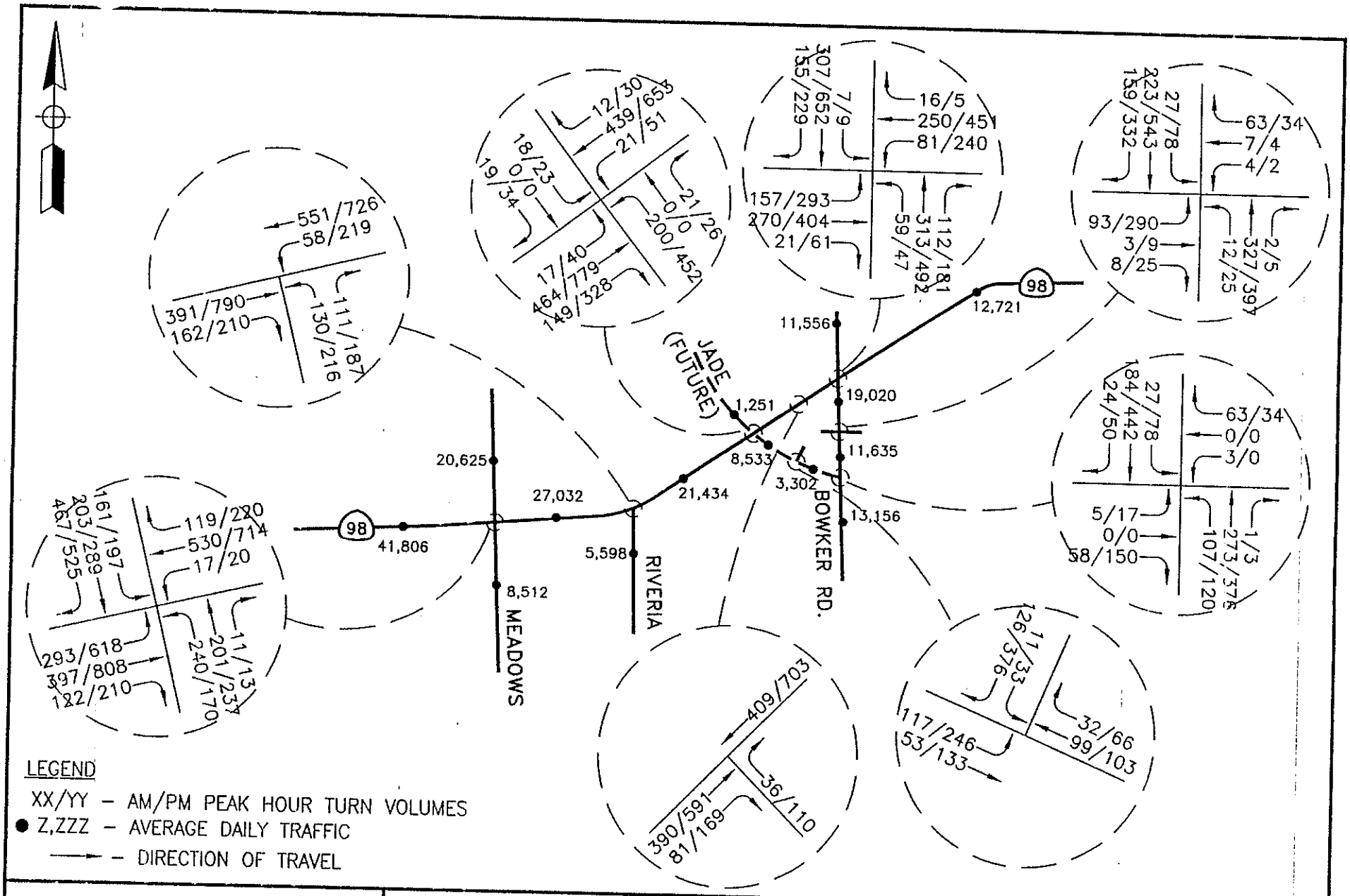
FIGURE 19

EXISTING + OTHERS TRAFFIC VOLUMES



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

——→ – DIRECTION OF TRAVEL

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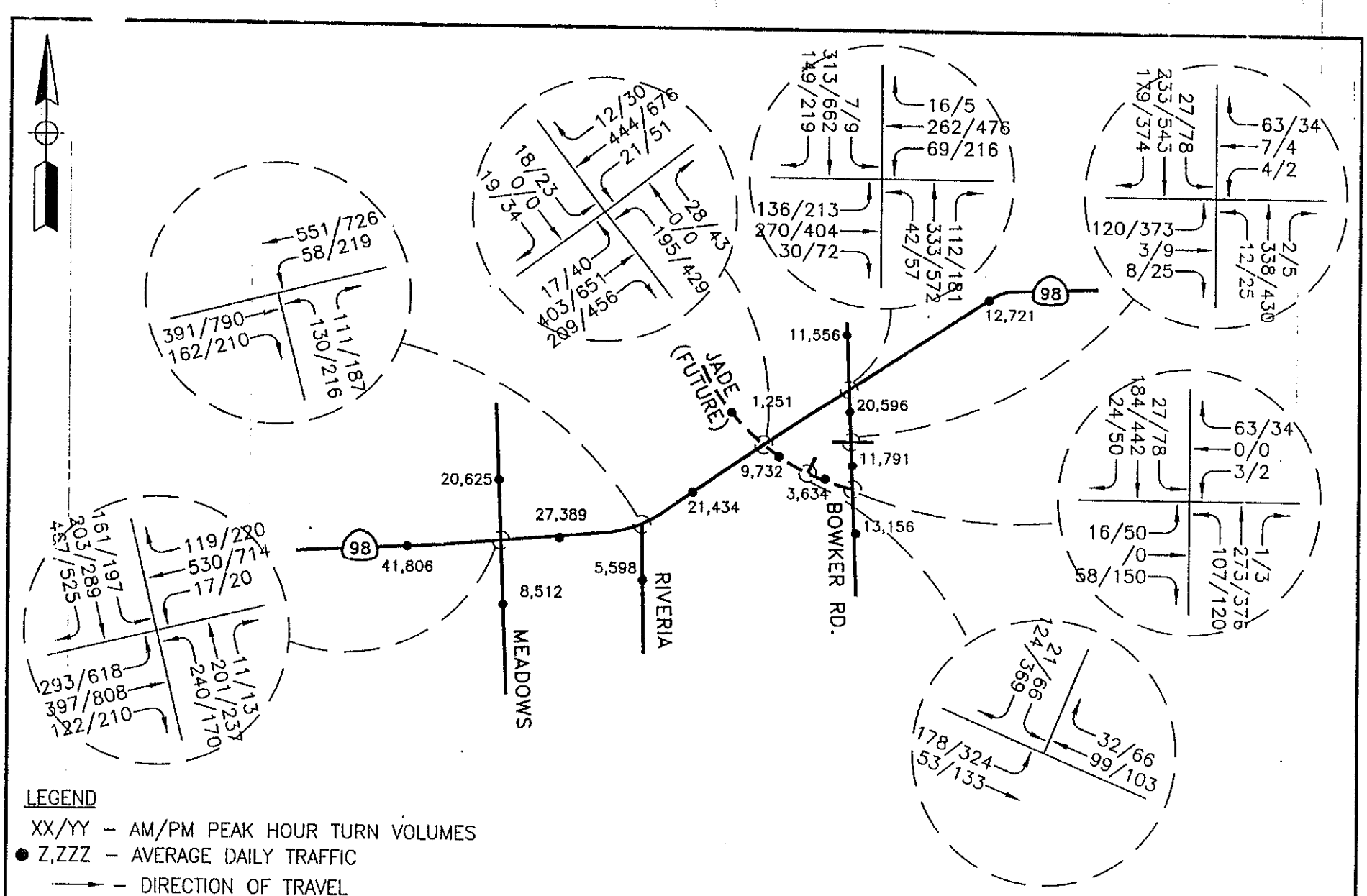
FIGURE 20

NEAR TERM CUMULATIVE TRAFFIC VOLUMES ALTERNATIVE 1



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

→ – DIRECTION OF TRAVEL

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FIGURE 21

NEAR TERM CUMULATIVE TRAFFIC VOLUMES ALTERNATIVE 2

Table 14 - Near Term Cumulative Segment Daily Level of Service Summary

Alternative # 1

Roadway Segment	Class	Capacity[1]	Existing + Others		Project Traffic ADT	Near Term Cumulative		
			ADT	LOS		ADT	LOS	Significant[2]
SR98								
Rockwood To Meadows	SA	34,200	**37,550**	**F**	4,256	**41,806**	**F**	**No, See Table 15**
Meadows to Bowker	C	16,200	**17,178**	**F**	4,256	**21,434**	**F**	**Yes**
Bowker to Barbara Worth	C	16,200	**11,816**	**E**	905	**12,721**	**E**	**No, See Table 15**
Bowker								
Cole to SR98	C	16,200	**6,943**	**C**	4,613	**11,556**	**E**	**Yes**
South of SR98	C	16,200	**9,894**	**D**	9,126	**19,020**	**F**	**Yes**
Jade								
SR98 to Bowker	SA	34,200	2,307	A	6,226	8,533	A	N/A

Alternative #2

Roadway Segment	Class	Capacity[1]	Existing + Others		Project Traffic ADT	Near Term Cumulative		
			ADT	LOS		ADT	LOS	Significant[2]
SR98								
Rockwood To Meadows	SA	34,200	**37,550**	**F**	4,256	**41,806**	**F**	**No, See Table 15**
Meadows to Bowker	C	16,200	**17,178**	**F**	4,256	**21,434**	**F**	**Yes**
Bowker to Barbara Worth	C	16,200	**11,816**	**E**	905	**12,721**	**E**	**No, See Table 15**
Bowker								
Cole to SR98	C	16,200	**6,943**	**C**	4,613	**11,556**	**E**	**Yes**
South of SR98	C	16,200	**9,894**	**D**	10,702	**20,596**	**F**	**Yes**
Jade								
SR98 to Bowker	SA	34,200	2,307	A	7,425	9,732	A	N/A

[1] Capacity is based on the upper limit of LOS E per the County of Imperial Level of Service Thresholds
[2] A project is considered to be significant if it worsens the street segment LOS from LOS C or better to LOS D or worse. The only exception is if the street segment operating at LOS D with project traffic added and all the intersections along the street segment operate at LOS D or better during peak periods, then the impact is not considered to be significant. If the street segment is already operating at LOS E or LOS F without the project traffic, the impact is considered to be cumulative.
[3] The intersections operate at LOS D or better, therefore the project's impact is not significant.
ADT=Average Daily Traffic; LOS = Level of Service; C = Collector ; SA=Secondary Arterial

Table 15 –Near Term Cumulative Segment Peak Hour Level of Service Summary

Multi Lane Roads

AM Peak

Roadway Segment	Direction	Existing+Others		Near Term Cumulative (Alternative 1)			Near Term Cumulative (Alternative 2)		
		Density	LOS	Density	LOS	Δ Density	Density	LOS	Δ Density
SR98 Rockwood to Meadows/Andrade	EB	8.8	A	10.1	A	1.3	10.1	A	1.3
	WB	14.2	B	15.4	B	1.2	15.4	B	1.2

PM Peak

SR98 Rockwood to Meadows/Andrade	EB	16.4	B	20.3	C	3.9	20.3	C	3.9
	WB	14.2	B	17.5	B	3.3	17.5	B	3.3

Two Lane Roads

Roadway Segment	Segment Length	Existing+Others			Near Term Cumulative (Alternative 1)					Near Term Cumulative (Alternative 2)				
		Avg Speed (mph)	Travel Time (sec)	LOS	Avg Speed (mph)	Travel Time (sec)	LOS	Δ Speed (mph)	Δ Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	LOS	Δ Speed (mph)	Δ Travel Time (sec)
AM Peak Hour														
SR98 Meadows to Bowker	1.0	54.2	66.4	C	52.8	68.2	D	(1.4)	1.8	53.3	67.5	D	(0.9)	1.1
Bowker to Barbara Worth	2.2	53.6	147.8	B	53.0	149.4	C	(0.6)	1.2	53.0	149.4	C	(0.6)	1.2
Bowker Cole to SR98	0.5	44.9	40.1	D	41.6	43.3	D	(3.3)	3.2	41.6	43.3	D	(3.3)	3.2
PM Peak Hour														
SR98 Meadows to Bowker	1.0	49.4	72.9	D	**46.9**	**76.8**	**E**	**(2.5)**	**3.9**	**47.6**	**75.6**	**E**	**(1.8)**	**2.7**
Bowker to Barbara Worth	2.2	49.8	159.0	D	48.3	164.0	D	(1.5)	5.0	48.3	164.0	D	(1.5)	5.0
Bowker Cole to SR98	0.5	42.3	42.6	D	**35.5**	**50.7**	**E**	**(6.8)**	**8.1**	**35.5**	**50.7**	**E**	**(6.8)**	**8.1**

Density is measured in passenger cars per mi per lane. LOS = Level of Service; Avg. Speed = Average Travel Speed in miles per hour (mph);
Travel Time = [Segment Length (miles) * 3600 seconds / hour] ÷ [Avg. Speed (mph)]Δ Speed = change in speed; Δ Travel Time = Change in Travel Time

Intersections

The intersections were analyzed under existing plus others and near term cumulative conditions. The intersections' levels of service for near term cumulative conditions are summarized in Table 16 and the ILV analysis is summarized in Table 17. A copy of the Synchro and ILV analysis worksheets for near term cumulative without and with project conditions can be found in Appendix G and H, respectively.

As can be seen in Table16, the SR98/Meadows Road-Andrade Road and Jade Road/Bowker Road intersections will operate at LOS C or better under both alternatives. The SR98/Project Access will operate at LOS C or better for alternative 1. The SR98/Rivera Road and SR98/Bowker Road intersections will operate with critical movements at LOS F with and without the project traffic. The SR98/Jade Road intersection will operate with critical movements at LOS F or worse with and without the project traffic during at least one peak hour. As a stop controlled intersection the Bowker Road/Project access intersection will operate at LOS E or worse for either project alternative. The project is considered to have a cumulative impact on all of the above mentioned intersections.

As can be seen in Table 17, the SR98/Meadows Road-Andrade Road intersection will operate under stable flow conditions with and without either project alternative.

2030 WITHOUT PROJECT CONDITIONS

Under 2030 conditions, all roadways were assumed to be constructed to their ultimate classification. Figure 22 illustrates the 2030 roadway network. To obtain the 2030 without project traffic volumes the future traffic generated by all of the known cumulative projects was added to the existing traffic volumes. The 2030 traffic volumes are illustrated in Figure 23.

2030 WITH PROJECT CONDITIONS

The project traffic for each alternative was added to the 2030 without project conditions to obtain the 2030 with project traffic volumes. Figures 24 and 25 show the 2030 plus project traffic volumes for each alternative.

Roadway Segments

The roadway segments were analyzed under 2030 conditions with and without the proposed project. The roadway segments daily levels of service are summarized in Table 18 and the peak hour analysis is summarized in Table 19.

As can be seen in Tables 18 and 19, under 2030 daily conditions, SR98 between Rockwood Avenue and Meadows Road/Andrade Road operates at LOS F, the project (either alternative) adds an additional 4,256 trips to this segment, the peak hour analysis shows that this segment will operate at LOS D or better during both peak hours with the addition of project traffic; therefore, the project is not considered to have a cumulative impact. SR98 between Meadows Road/Andrade Road and Bowker Road operates at LOS E under 2030 conditions, the project (either alternative) adds 4,256 trips to this segment, the peak hour analysis shows that this segment will operate at LOS B or better during the peak hours, therefore the project is not considered to have a significant impact on this segment. SR98 between Bowker Road and Barbara Worth operates at LOS B with and without the project traffic; the peak hour analysis shows that this segment will operate at LOS A during the peak hours. Bowker Road between Cole Road and SR98, Bowker Road south of SR98, and Jade Road between SR98 and Bowker Road will operate at LOS C or better with or without the project traffic.

Table 16 - Near Term Cumulative Intersection Level of Service Summary

AM Peak Hour

Intersection	Critical Move	Existing+ Others		Near Term Cumulative (Alternative 1)				Near Term Cumulative (Alternative 2)			
		Delay[1]	LOS	Delay[1]	LOS	Δ Delay	Sign?[2]	Delay[1]	LOS	Δ Delay	Sign? [2]
SR98 @ Meadows/Andrade (Sig)	Int	25.6	C	26.9	C	1.3	N/A	26.9	C	1.3	N/A
SR98 @ Rivera (OWSC)	NB	**41.9**	**F**	**95.4**	**F**	**53.5**	**YES**	**95.4**	**F**	**53.5**	**YES**
SR98 @ Jade (TWSC)	EBL	8.3	A	8.4	A	0.1	**YES**	8.4	A	0.1	**YES**
	WBL	8.3	A	9.0	A	0.7		9.0	A	0.7	
	NB	26.0	D	**229.1**	**F**	**203.1**		**188.6**	**F**	**162.6**	
	SB	15.7	C	19.4	C	3.7		18.6	C	2.9	
SR98 @ Project Access (OWSC)	NBR	-	-	11.5	B	-	N/A	-	-	-	N/A
SR98 @ Bowker (TWSC)	NB	**149.0**	**F**	**>999**	**F**	**>999**	**YES**	**>999**	**F**	**>999**	**YES**
	SB	**67.4**	**F**	**>999**	**F**	**>999**		**>999**	**F**	**>999**	
Jade @ Project Access	SB	-	-	9.7	A	-	N/A	10.5	B	-	N/A
Jade @ Bowker (TWSC)	EB	9.5	A	10.6	B	1.1	N/A	12.4	B	2.9	N/A
	WB	-	-	10.8	B	-		10.8	B	-	
Bowker @ Project Access (TWSC)	EB	-	-	29.3	D	-	N/A	**38.1**	**E**	-	**YES**
	WB	-	-	12.2	B	-		12.5	B	-	

PM Peak Hour

Intersection	Critical Move	Existing+ Others		Near Term Cumulative (Alternative 1)				Near Term Cumulative (Alternative 2)			
		Delay	LOS	Delay	LOS	Δ Delay	Sign?	Delay	LOS	Δ Delay	Sign?
SR98 @ Meadows/Andrade (Sig)	Int	27.3	C	30.8	C	3.5	N/A	30.8	C	3.5	N/A
SR98 @ Rivera (OWSC)	NB	**>999**	**F**	**>999**	**F**	-	**YES**	**>999**	**F**	-	**YES**
SR98 @ Jade (TWSC)	EBL	9.2	A	9.4	A	0.2	**YES**	9.5	A	0.3	**YES**
	WBL	9.2	A	11.9	B	2.7		11.7	B	2.5	
	NB	**219.9**	**F**	**>999**	**F**	**>999**		**>999**	**F**	**>999**	
	SB	28.4	D	**63.1**	**F**	**34.7**		**52.6**	**F**	**25.2**	
SR98 @ Project Access (OWSC)	NBR	-	-	17.0	C	- -	N/A	-	-	-	N/A
SR98 @ Bowker (TWSC)	NB	**>999**	**F**	**>999**	**F**	**>999**	**YES**	**>999**	**F**	**>999**	**YES**
	SB	**>999**	**F**	**>999**	**F**	**>999**		**>999**	**F**	**>999**	
Jade @ Project Access	SB	-	-	15.2	C	-	N/A	**40.7**	**E**	-	**YES**
Jade @ Bowker (TWSC)	EB	12.8	B	17.7	C	4.9	N/A	30.8	D	18.0	N/A
	WB			13.9	B	-		13.9	B	-	
Bowker @ Project Access (TWSC)	EB	-	-	29.3	D	-	N/A	**>999**	**F**	-	**YES**
	WB	-	-	12.3	B	-		18.8	C	-	

[1] measured in seconds/vehicle,
[2] significance only applies to LOS E or worse when the change in delay is greater than 2 seconds
Crit. Mov. = Critical Movement; LOS = Level of Service; Sig. = Signalized; Sign? =Significant; OWSC = One-Way Stop-Controlled; TWSC= Two Way Stop Controlled, EB= Eastbound; WB=Westbound; NB=Northbound; NBR=Northbound Right; SB= Southbound; Int = Intersection. N/A=Not Applicable

Table 17 – Near Term Cumulative ILV Summary

Intersection	Existing Plus Others				Near Term Cumulative				
	AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour	
	ILV/Hour	Operating Condition	ILV/Hour	Operating Condition	Alt	ILV/Hour	Operating Condition	ILV/Hour	Operating Condition
SR98@ Meadows/Andrade	923	Stable Flow	988	Stable Flow	1	972	Stable Flow	1,126	Stable Flow
					2	972	Stable Flow	1,126	Stable Flow

ILV=Intersecting Lane Volumes
<1200 ILV/hour = Stable Flow
1200 – 1500 ILV/hour = Unstable Flow
1500 ILV/hour = Capacity – Heavy Congestion

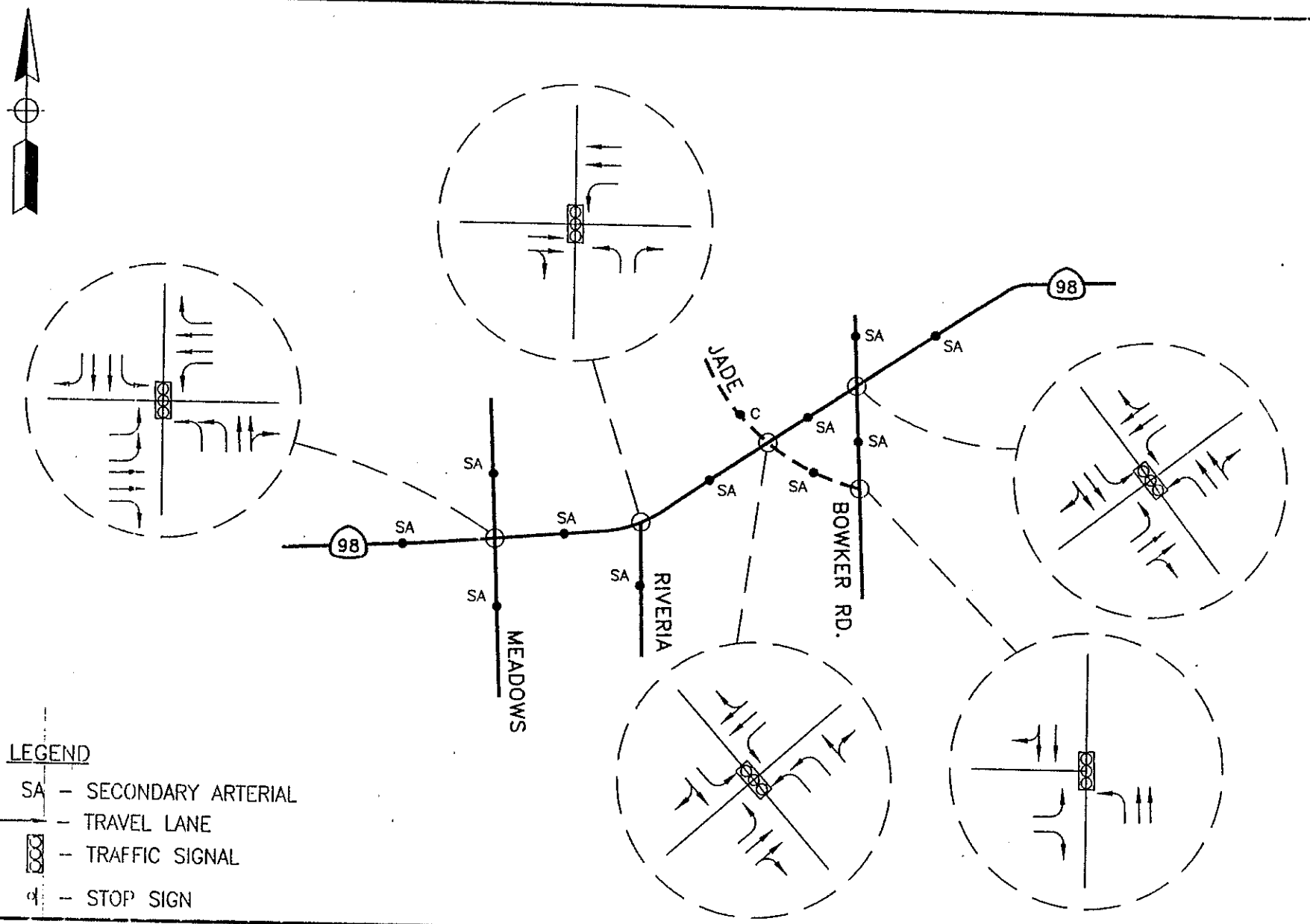

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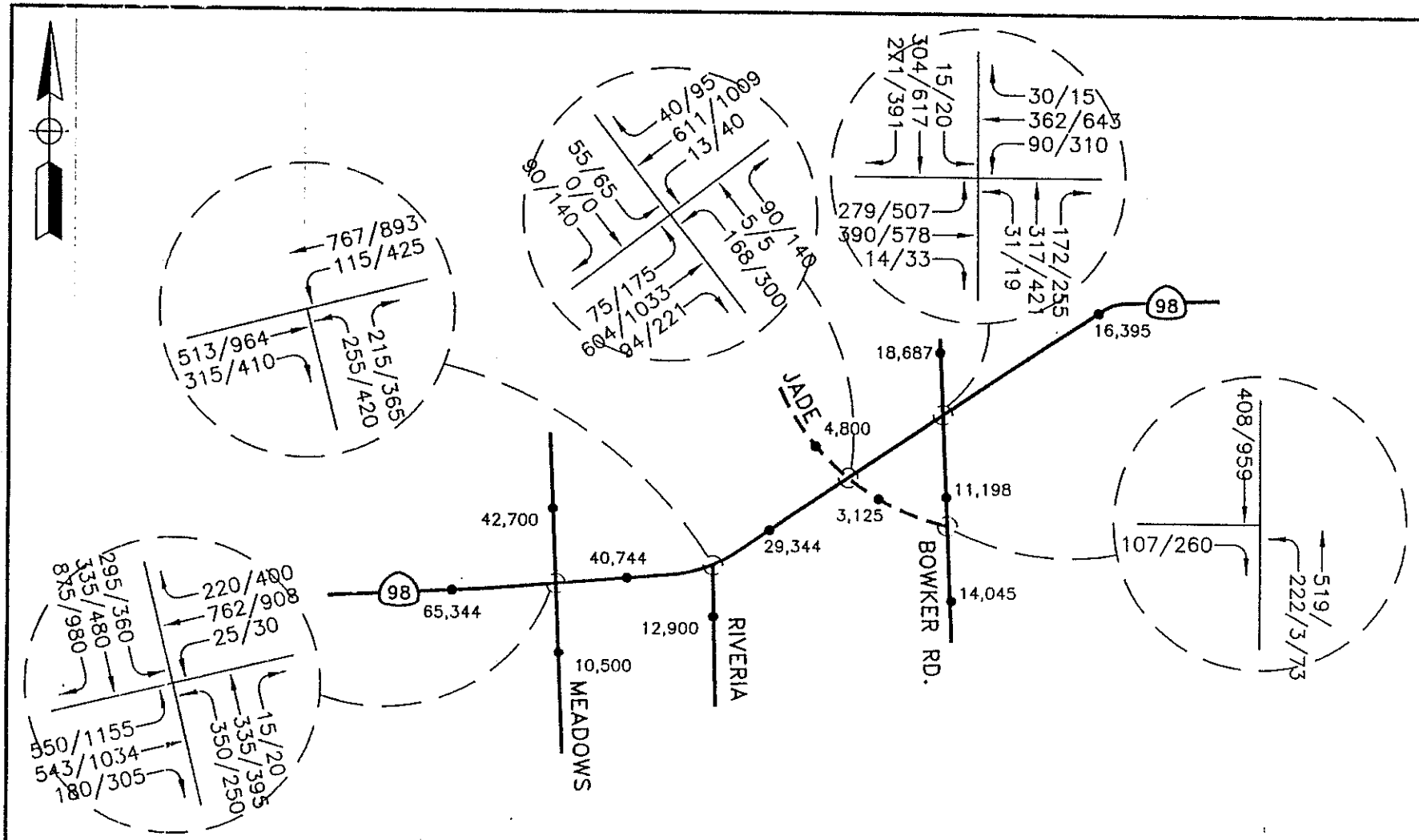
FIGURE 22

2030 CONDITIONS



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

⟶ – DIRECTION OF TRAVEL

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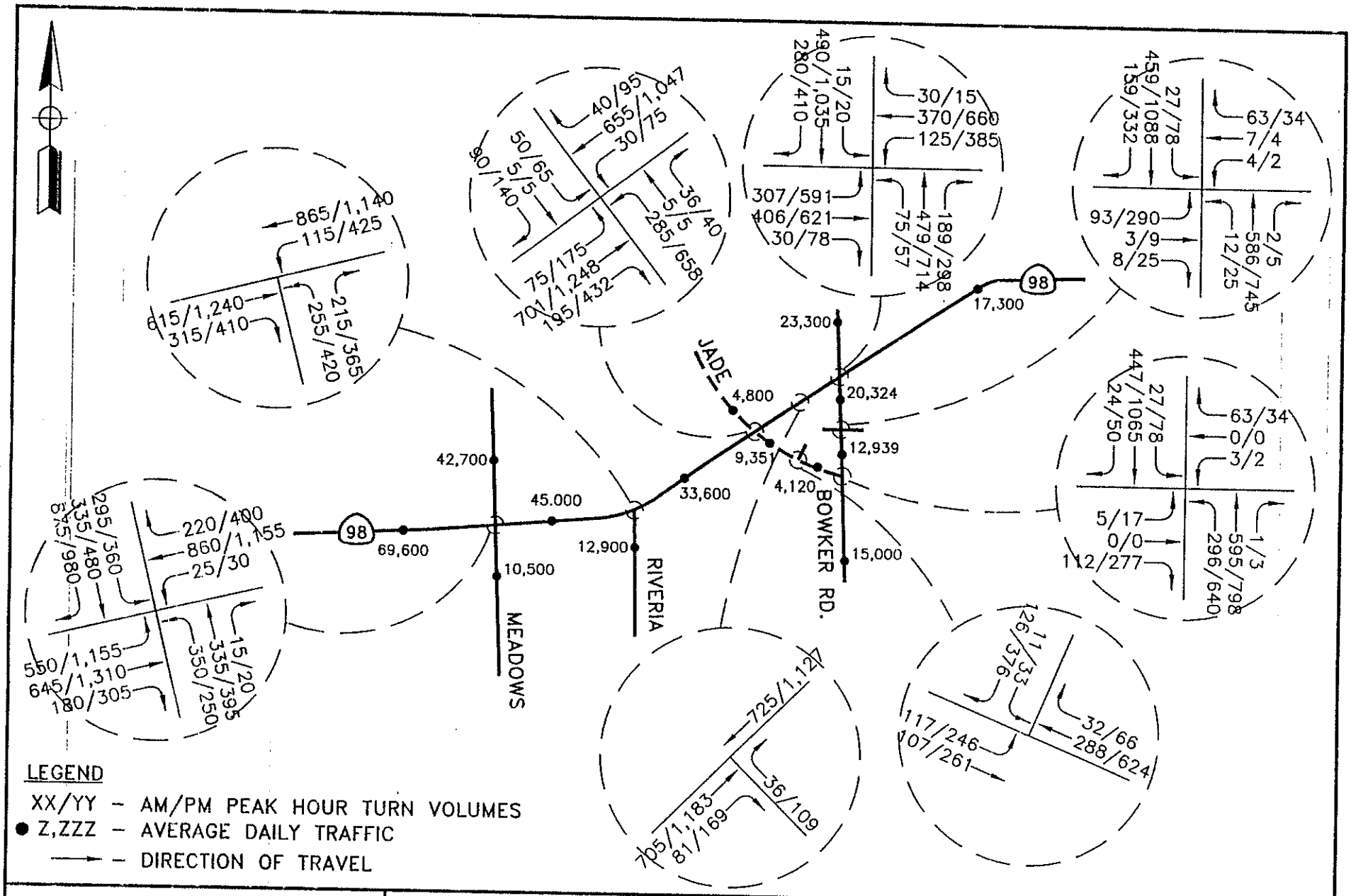
FIGURE 23

2030 TRAFFIC VOLUMES



LEGEND

XX/YY – AM/PM PEAK HOUR TURN VOLUMES

● Z,ZZZ – AVERAGE DAILY TRAFFIC

→ – DIRECTION OF TRAVEL

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FIGURE 24

2030 + PROJECT TRAFFIC VOLUMES (ALTERNATIVE 1)

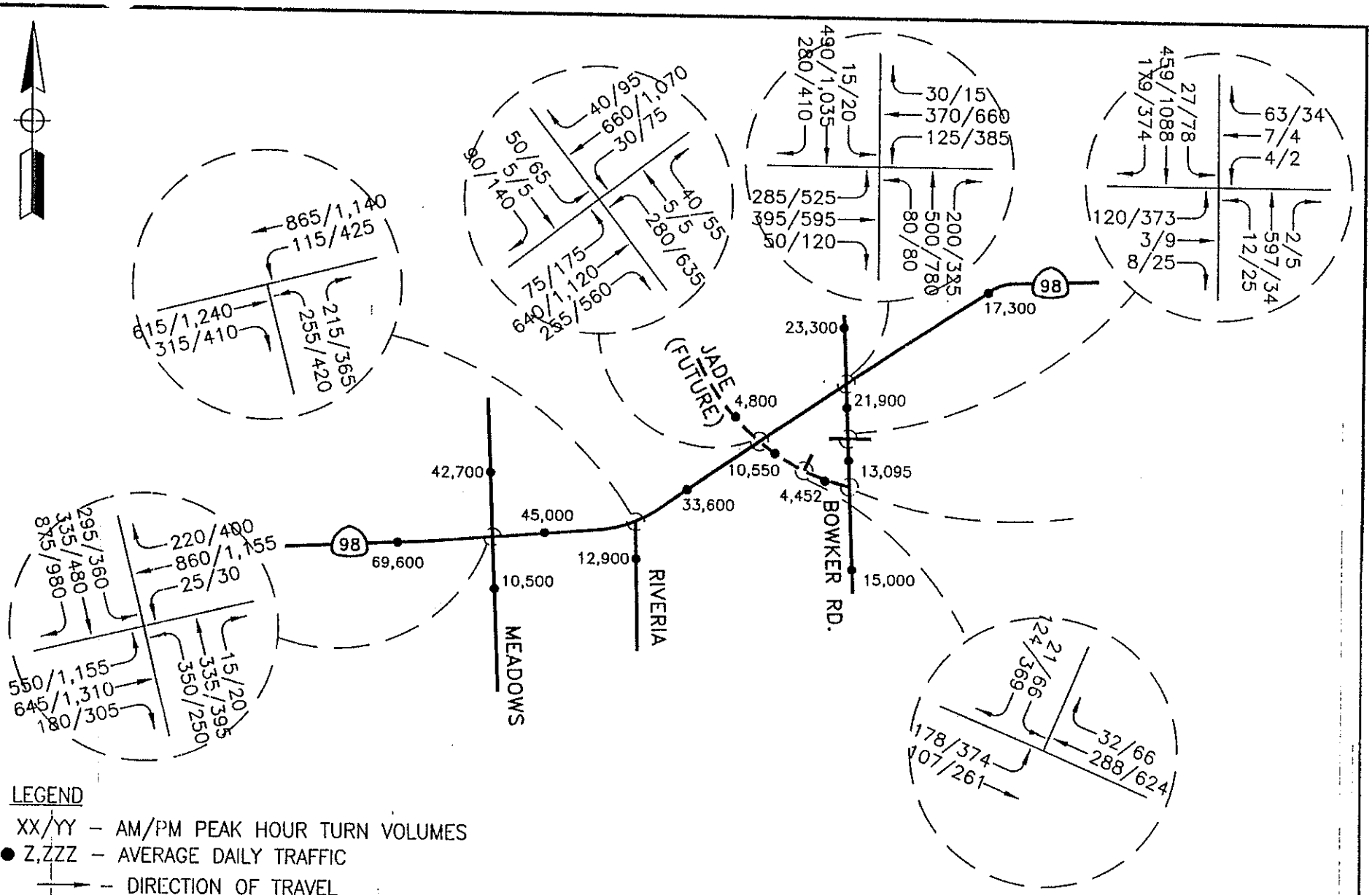

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FIGURE 25

2030 + PROJECT TRAFFIC VOLUMES (ALTERNATIVE 2)

Table 18 -2030 Segment Daily Level of Service Summary

Alternative # 1

Roadway Segment	Class	Capacity1	2030		Project Traffic	2030 Plus Project		
			ADT	LOS	ADT	ADT	LOS	Significant [2]
SR98								
Rockwood To Meadows	MA	37,000	**65,344**	**F**	4,256	**69,600**	**F**	**No, See Table 19**
Meadows to Bowker	MA	37,000	29,344	C	4,256	**33,600**	**E**	**No, See Table 19**
Bowker to Barbara Worth	MA	37,000	16,395	B	905	17,300	B	N/A
Bowker								
Cole to SR98	SA	34,200	18,687	B	4,613	23,300	C	N/A
South of SR98	SA	34,200	11,198	A	9,126	20,324	B	N/A
Jade								
SR98 to Bowker	SA	34,200	3,125	A	6,226	9,351	A	N/A

Alternative # 2

Roadway Segment	Class	Capacity1	2030		Project Traffic	2030 Plus Project		
			ADT	LOS	ADT	ADT	LOS	Significant [2]
SR98								
Rockwood To Meadows	MA	37,000	**65,344**	**F**	4,256	**69,600**	**F**	**No, See Table 19**
Meadows to Bowker	MA	37,000	29,344	C	4,256	**33,600**	**E**	**No, See Table 19**
Bowker to Barbara Worth	MA	37,000	16,395	B	905	17,300	B	N/A
Bowker								
Cole to SR98	SA	34,200	18,687	B	4,613	23,300	C	N/A
South of SR98	SA	34,200	11,198	A	10,702	21,900	B	N/A
Jade								
SR98 to Bowker	SA	34,200	3,125	A	7,425	10,500	A	N/A

[1] Capacity is based on the upper limit of LOS E per the County of Imperial Level of Service Thresholds
[2]A project is considered to be significant if it worsens the street segment LOS from LOS C or better to LOS D or worse. The only exception is if the street segment operating at LOS D with project traffic added and all the intersections along the street segment operate at LOS D or better during peak periods, then the impact is not considered to be significant. If the street segment is already operating at LOS E or LOS F without the project traffic, the impact is considered to be cumulative.
ADT=Average Daily Traffic; LOS = Level of Service; C = Collector ; SA=Secondary Arterial

Table 19 –2030 Segment Peak Hour Level of Service Summary									
Multi Lane Roads									
AM Peak									
Roadway Segment	**Direction**	**2030**		**2030 + Project (Alternative 1)**			**2030 + Project (Alternative 2)**		
		Density	**LOS**	**Density**	**LOS**	**Δ Density**	**Density**	**LOS**	**Δ Density**
SR98									
Rockwood to Meadows/Andrade	EB	15.8	B	17.1	B	1.3	17.1	B	1.3
	WB	24.7	C	25.9	C	1.2	25.9	C	1.2
Meadows/Andrade to Bowker	EB	7.9	A	8.9	A	1.0	8.4	A	0.5
	WB	9.4	A	9.9	A	0.5	10.0	A	0.6
Bowker to Barbara Worth	EB	5.4	A	5.7	A	0.3	5.7	A	0.3
	WB	4.5	A	4.9	A	0.4	4.9	A	0.4
Bowker Road									
Cole to SR98	NB	6.9	A	8.9	A	2.0	8.9	A	2.0
	SB	6.5	A	8.6	A	2.1	8.6	A	2.1
PM Peak									
SR98									
Rockwood to Meadows/Andrade	EB	31.0	D	34.9	D	3.9	34.9	D	3.9
	WB	26.6	D	29.7	D	3.1	29.7	D	3.1
Meadows/Andrade to Bowker	EB	13.2	B	15.4	B	2.2	14.3	B	1.1
	WB	12.5	B	13.1	B	0.6	13.4	B	0.9
Bowker to Barbara Worth	EB	7.9	A	8.8	A	0.9	8.8	A	0.9
	WB	8.9	A	9.9	A	1.0	9.9	A	1.0
Bowker Road									
Cole to SR98	NB	10.3	A	14.5	B	4.2	14.5	B	4.2
	SB	11.3	A	16.1	B	4.8	16.1	B	4.8

Density is measured in passenger cars per mi per lane. LOS = Level of Service;

Intersections

The intersections were analyzed under 2030 conditions with and without the proposed project. The intersections' levels of service for future conditions are summarized in Table 20. The ILV analysis is provided in Table 21. A copy of the Synchro and ILV analysis worksheets for future conditions without and with project conditions can be found in Appendix I and J, respectively.

As can be seen in Table 20 all intersections will operate at LOS D or better during the AM peak hour with and without the project (either alternative) traffic. During the PM peak hour under 2030 conditions, the SR98/Meadows Road-Andrade Road, SR98/Rivera Road, and SR98/Bowker Road intersections will operate at LOS E or worse. All other intersections will operate at LOS D or better under 2030 conditions in the PM peak hour. With the addition of Alternative 1 project traffic, The SR98/Meadows Road-Andrade Road, SR98/Rivera Road, and SR98/Bowker Road intersections will operate at LOS E or worse during the PM peak hour. The project increases the delay by 11.4 seconds or more and is therefore considered to be significant. All other intersections will operate at LOS D or better under 2030 plus project Alternative 1 conditions. With the addition of Alternative 2 project traffic, the SR98/Meadows Road-Andrade Road, SR98/Rivera Road, SR98/Bowker Road, and Jade/Project Access intersections will operate at LOS E or worse during the PM peak hour. The project traffic increases the delay by 11.4 seconds or more at these intersections and is therefore considered to be significant. All other intersections will operate at LOS D or better under 2030 plus project Alternative 2 conditions.

As can be seen in ILV analysis in Table 21, under 2030 conditions the SR98/Meadows Road-Andrade Road intersection will operate at over capacity during both peak hours and the SR98/Rivera Road intersection will operate at over capacity during the PM peak hour. With the addition of project traffic from either alternative to the 2030 traffic volumes, the SR98/Meadows Road-Andrade Road intersection will operate at over capacity during both peak hours, and the SR98/Rivera Road and SR98/Bowker Road intersections will operate at over capacity during the PM peak hour. All other intersections will operate at stable or unstable flow.

Table 20 - 2030 Intersection Level of Service Summary											
Intersection	Critical Move	2030		2030 + Project (Alternative 1)				2030 + Project (Alternative 2)			
		Delay[1]	LOS	Delay[1]	LOS	Δ Delay	Sign?[2]	Delay[1]	LOS	Δ Delay	Sign?[2]
AM Peak Hour											
SR98 @ Meadows/Andrade (Sig)	Int	50.5	D	54.5	D	4.0	N/A	54.5	D	4.0	N/A
SR98 @ Rivera (Sig)	Int	13.2	B	14.0	B	0.8	N/A	14.0	B	0.8	N/A
SR98 @ Jade (Sig)	Int	13.1	B	13.9	B	0.8	N/A	13.8	B	0.7	N/A
SR98 @ Project Access (OWSC)	NBR	-	-	11.6	B	-	N/A	-	-	-	N/A
SR98 @ Bowker (Sig)	Int	27.9	C	29.1	C	1.2	N/A	28.0	C	0.1	N/A
Jade @ Project Access (OWSC)	SB	-	-	10.3	B	-	N/A	11.3	B	-	N/A
Jade @ Bowker (Sig)	Int	13.4	B	14.8	B	1.4	N/A	14.1	B	0.7	N/A
Bowker @ Project Access (Sig)	Int	-	-	12.4	B	-	N/A	10.9	B	-	N/A
PM Peak Hour											
SR98 @ Meadows/Andrade (Sig)	Int	**86.0**	**F**	**97.4**	**F**	**11.4**	**YES**	**97.4**	**F**	**11.4**	**YES**
SR98 @ Rivera (Sig)	Int	**55.1**	**E**	**77.0**	**E**	**21.9**	**YES**	**76.9**	**E**	**21.8**	**YES**
SR98 @ Jade (Sig)	Int	18.6	B	35.6	D	17.0	N/A	32.9	C	14.3	N/A
SR98 @ Project Access (OWSC)	NBR	-	-	12.0	B	-	N/A	-	-		
SR98 @ Bowker (Sig)	Int	**58.4**	**E**	**101.6**	**F**	**43.2**	**YES**	**95.8**	**F**	37.4	**YES**
Jade @ Project Access (OWSC)	SB	-	-	23.2	C	-	N/A	**204.4**	**F**	-	**YES**
Jade @ Bowker (Sig)	Int	24.7	C	31.4	C	6.7	N/A	33.4	C	8.7	N/A
Bowker @ Project Access (Sig)	Int	-	-	23.4	C	-	**N/A**	27.8	C	-	N/A

[1] measured in seconds/vehicle,
[2] significance only applies to LOS E or worse when the change in delay is greater than 2 seconds
Crit. Mov. = Critical Movement; LOS = Level of Service; Sig. = Signalized; Sign? =Significant; OWSC = One-Way Stop-Controlled; NBR=Northbound Right; SB= Southbound; Int = Intersection. N/A=Not Applicable

Table 21 – 2030 ILV Summary

Intersection	2030				2030 + Project				
	AM Peak Hour		PM Peak Hour		Alt	AM Peak Hour		PM Peak Hour	
	ILV/Hour	Operating Condition	ILV/Hour	Operating Condition		ILV/Hour	Operating Condition	ILV/Hour	Operating Condition
SR98@ Meadows/Andrade	1,551	**Over Capacity**	1,622	**Over Capacity**	1	1600	**Over Capacity**	1,995	**Over Capacity**
					2	1,600	**Over Capacity**	1,995	**Over Capacity**
SR98/Rivera	784	Stable Flow	1,532	**Over Capacity**	1	835	Stable Flow	1,670	**Over Capacity**
					2	835	Stable Flow	1,670	**Over Capacity**
SR98/Jade	603	Stable Flow	1,097	Stable Flow	1	761	Stable Flow	1,489	Unstable Flow
					2	758	Stable Flow	1,478	Unstable Flow
SR98/Bowker	800	Stable Flow	1,360	Unstable Flow	1	985	Stable Flow	1,721	**Over Capacity**
					2	973	Stable Flow	1,686	**Over Capacity**

ILV=Intersecting Lane Volumes
<1200 ILV/hour = Stable Flow
1200 – 1500 ILV/hour = Unstable Flow
1500 ILV/hour = Capacity – Heavy Congestion

SECTION V - PROJECT ACCESS

PROJECT ACCESS

The project has 2 Alternatives. Alternative 1 will have 3 access points and Alternative 2 will have 2 access points. The residential portions of the project has been designed to provide an additional access for the area through CM ranch that provides a connection from SR98 to Bowker Road via the extension of jade Road. This access will provide for permanent and temporary circulation improvements to allow development.

The location of the proposed commercial accesses on SR98, Jade Road, and Bowker Road were evaluated for adequacy and location. The following is a discussion on each access location.

SR98 Commercial Access

Access to/from the commercial property was evaluated (Alternative 1) as a right-in/out access between Bowker Road and Jade Road. The distance between intersections is approximately 1600 feet. To accommodate this access it is recommended that the access be located to provide a minimum of 600 feet from Jade Road and 700 feet from Bowker Road. With this spacing the right-in/out access can be located to provide sufficient room for the right turn deceleration lane and to provide sufficient distance for vehicles to exit the access, enter the through lanes and then enter the left turn lanes to turn north on Bowker Road. This intersection spacing will also provide the necessary channelization and turn lanes at each intersection.

Jade Road Commercial Access

Jade Road between SR98 and Bowker Road is planned as a four lane secondary arterial with a center turn lane. To accommodate the Venezia commercial property, an access will need to be constructed a minimum of 500 feet east of the centerline of SR98 and a minimum of 500 feet from the centerline of Bowker Road. This intersection spacing will allow full access to the commercial site and accommodate turning lanes at SR98 and Bowker Road.

Bowker Road Access

The tentative tract map for Venezia provides for a full access connection to Bowker Road approximately 1200 feet south of SR98. This intersection can accommodate access for the residential development as well as access to the southern portion of the commercial parcel. An additional access to the commercial and residential parcels can also be provided. To accommodate the turning lanes on Bowker Road at SR98, it is recommended that this access be located 600 feet south of the centerline of SR98. With this intersection spacing signalization of the commercial access/residential access and the Jade Road intersection can be accommodated and signal control installed.

The accesses were previously analyzed in Section IV. See Figures 26 through 33 located in Section VI, for an illustration of the lane configurations.

SECTION VI - PROJECT MITIGATION

A summary of the project's direct impacts and the recommended mitigation measures are summarized in Tables 22 and 23. A brief description of each of the mitigation measures is provided below. Figures illustrating the projects mitigation measures are illustrated in Figures 26 through 33. All mitigation tables and figures are located at the end of this section. Mitigated Analysis worksheets can be found in Appendix J.

ROADWAY SEGMENTS

Direct Impacts

- The project has a direct impact on the roadway segments of Bowker Road between SR98 and Jade Road with either project alternative.

- The projects impacts can be mitigated by widening Bowker Road to the classification of a Secondary Arterial by adding an additional travel lane in each direction.

Short Term Impacts

- The project does not have any short term segment impacts, it is suggested however, that Bowker Road between SR98 and Jade Road be widened..

- Bowker Road between SR98 and Jade Road should be widened to the classification of a Secondary Arterial by adding an additional travel lane in each direction.

Cumulative Impacts

- With either alternative, the project has a cumulative impact on SR98 between Meadows Road and Bowker Road and on Bowker Road between Cole Road and Jade Road.

- The cumulative impacts on SR98 can be mitigated by paying its fair share towards the widening this portion of SR98 to the classification of a Secondary Arterial by adding an additional travel lane in each direction. The cumulative impacts on Bowker Road can be mitigated by widening Bowker Road to the classification of a Secondary Arterial by adding an additional travel lane in each direction.

Future Impacts

- The project does not have a significant future impact on any of the analyzed roadway segments

INTERSECTIONS

Direct Impacts

- The project has a direct impact at the SR98/Jade Road, SR98/Bowker Road, and Bowker Road/Project Access intersections for both alternatives

- The SR98/Jade Road and SR98/Bowker Road intersections can be mitigated by signalizing the intersections. The Bowker Road/Project access would need to be an All-Way Stop-Control to operate at acceptable LOS under Existing plus Project conditions.

Short Term Impacts

- The project has an impact at the SR98/Rivera Road, SR98/Jade Road, and SR98/Bowker Road intersections for either alternative. Alternative 1 has an additional impact at the SR98/Project Access intersection and Alternative 2 has an additional impact on the Bowker Road/Project access intersection.

- The SR98/Rivera Road, SR98/Jade Road, and SR98/Bowker Road intersections can be mitigated by signalizing the intersections. The SR98/Project Access intersection can be mitigated by adding a eastbound deceleration lane. The Bowker Road/Project access would need to be an All-Way Stop-Control to operate at acceptable LOS.

Cumulative Impacts

- The project (either alternative) has a cumulative impact at the SR98/Rivera Road, SR98/Jade Road, SR98/Bowker Road intersections. Alternative 2 has additional cumulative impacts at the Jade Road/Project Access and Bowker Road/Project access intersections.

- The intersections along SR98 and Bowker Road would be widened to have 2 travel lanes in each direction due to the roadway segments needing to be widened. The SR98/Rivera Road, SR98/Jade Road, and SR98/Bowker Road, and Bower Road/Project Access intersections would need to be signalized. For alternative 2, the southbound approach for the Jade Road/Project access intersection would need to be designed to provide one right turn lane and one shared left-right turn lane.

Future Impacts

- The project (either alternative) has a future impact at the SR98/Meadows Road, SR98/Rivera Road, and SR98/Bowker Road intersections. Alternative 2 also has a significant impact at the Jade Road/Project Access intersection.

- The SR98/Meadows Road, SR98/Rivera Road, and SR98/Bowker Road intersections would need to be widened by adding additional turn lanes (See Figures 32 and 33). The Jade Road/Project Access intersection would need to be signalized.

FAIR SHARE CALCULATIONS

A fair share analysis for the projects impacts at the intersections was performed, the results are summarized in Table 24.

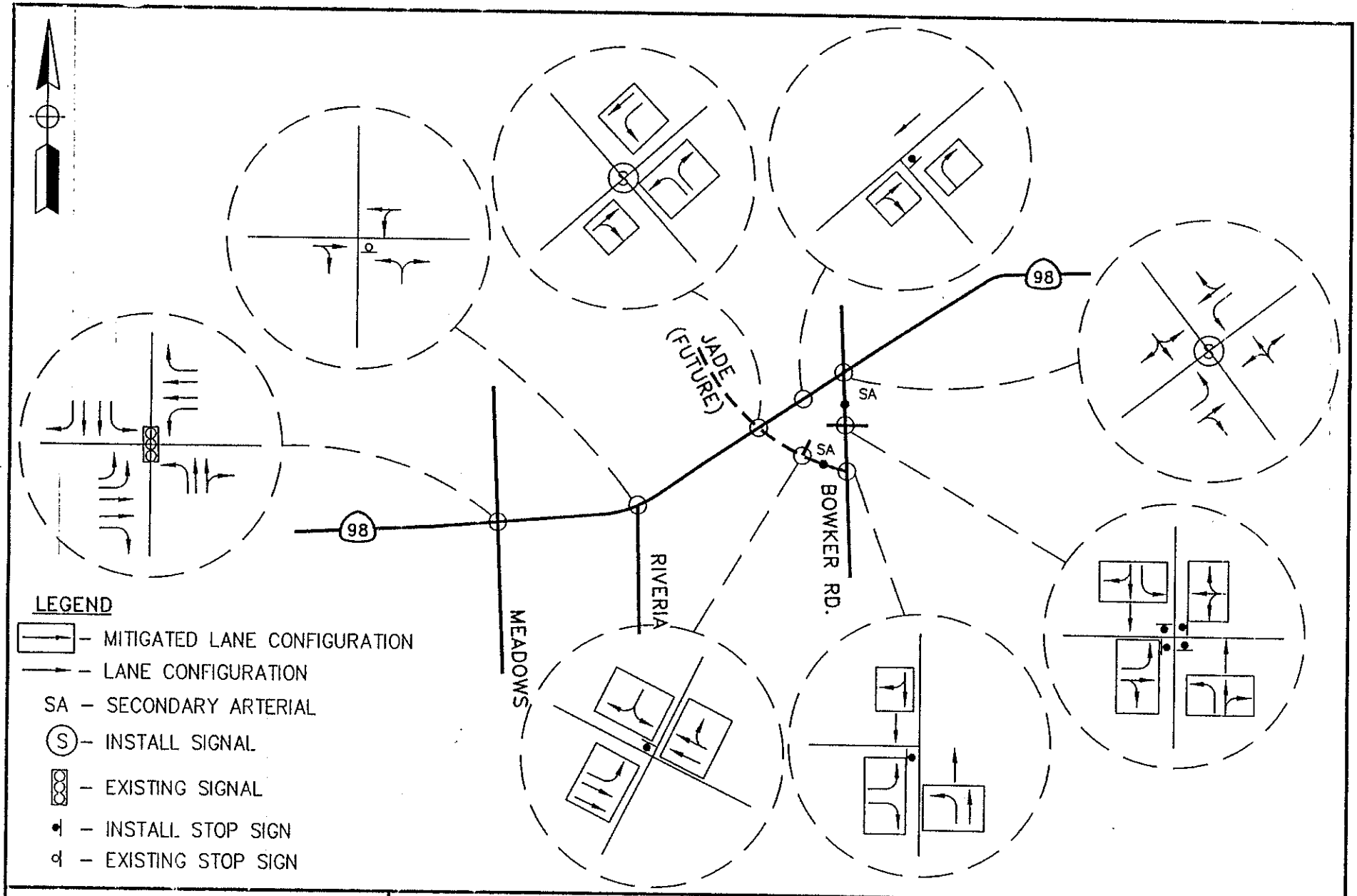

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FIGURE 26

MITIGATED EXISTING + PROJECT–ALTERNATIVE 1

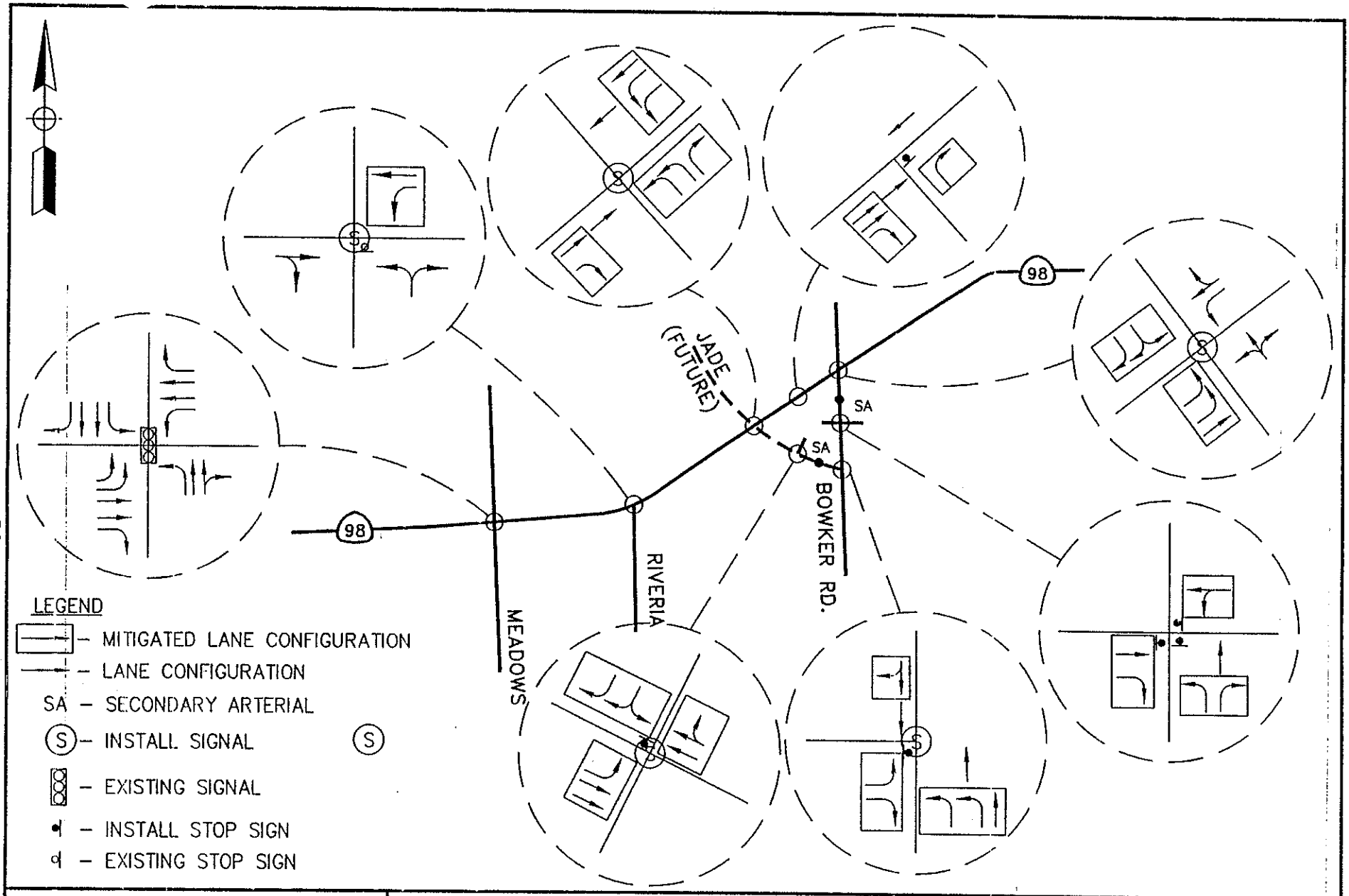

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FIGURE 27

MITIGATED EXISTING + PROJECT–ALTERNATIVE 2

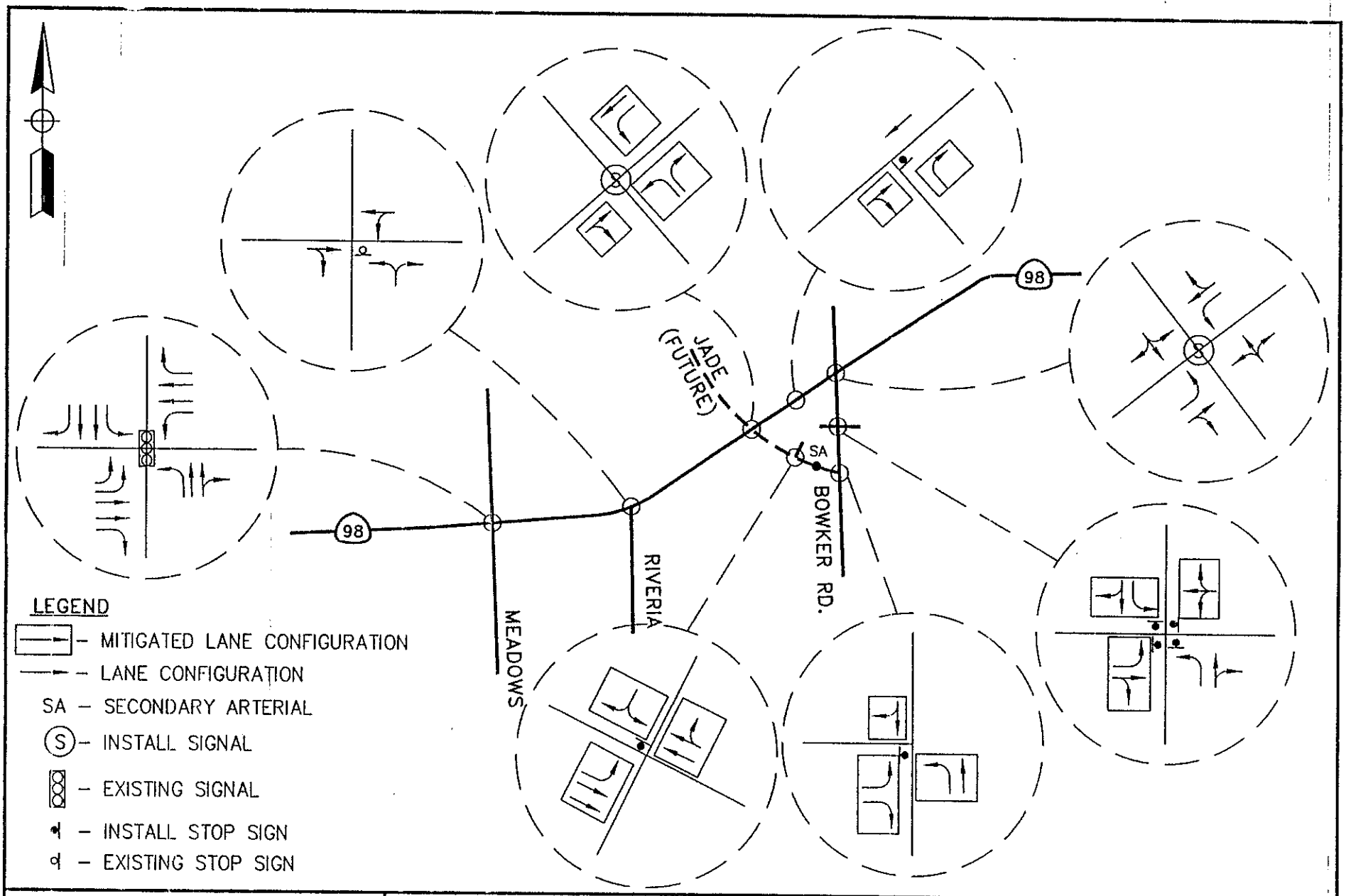

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FIGURE 28

MITIGATED SHORT TERM–ALTERNATIVE 1

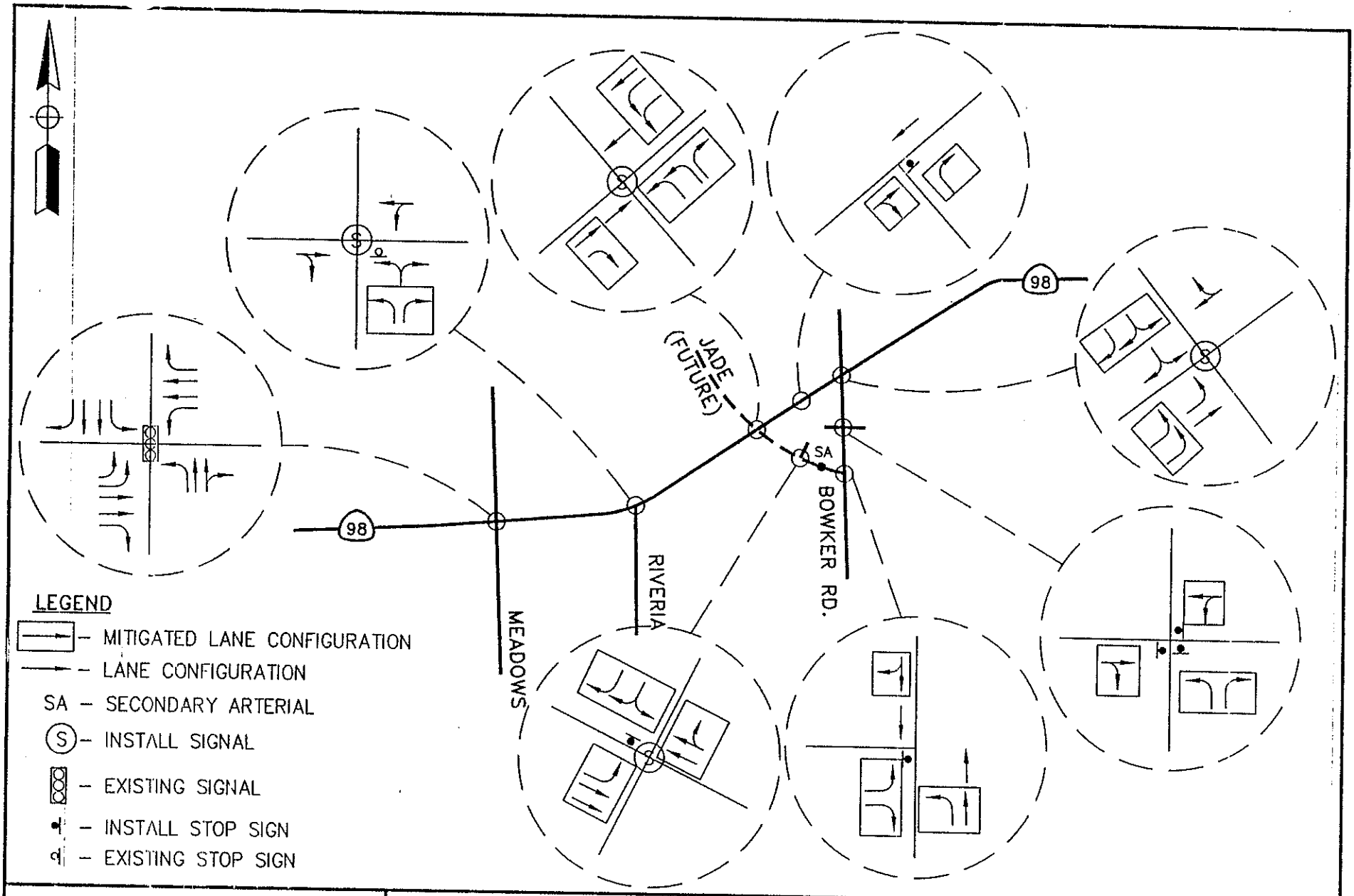

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FIGURE 29

MITIGATED SHORT TERM–ALTERNATIVE 2

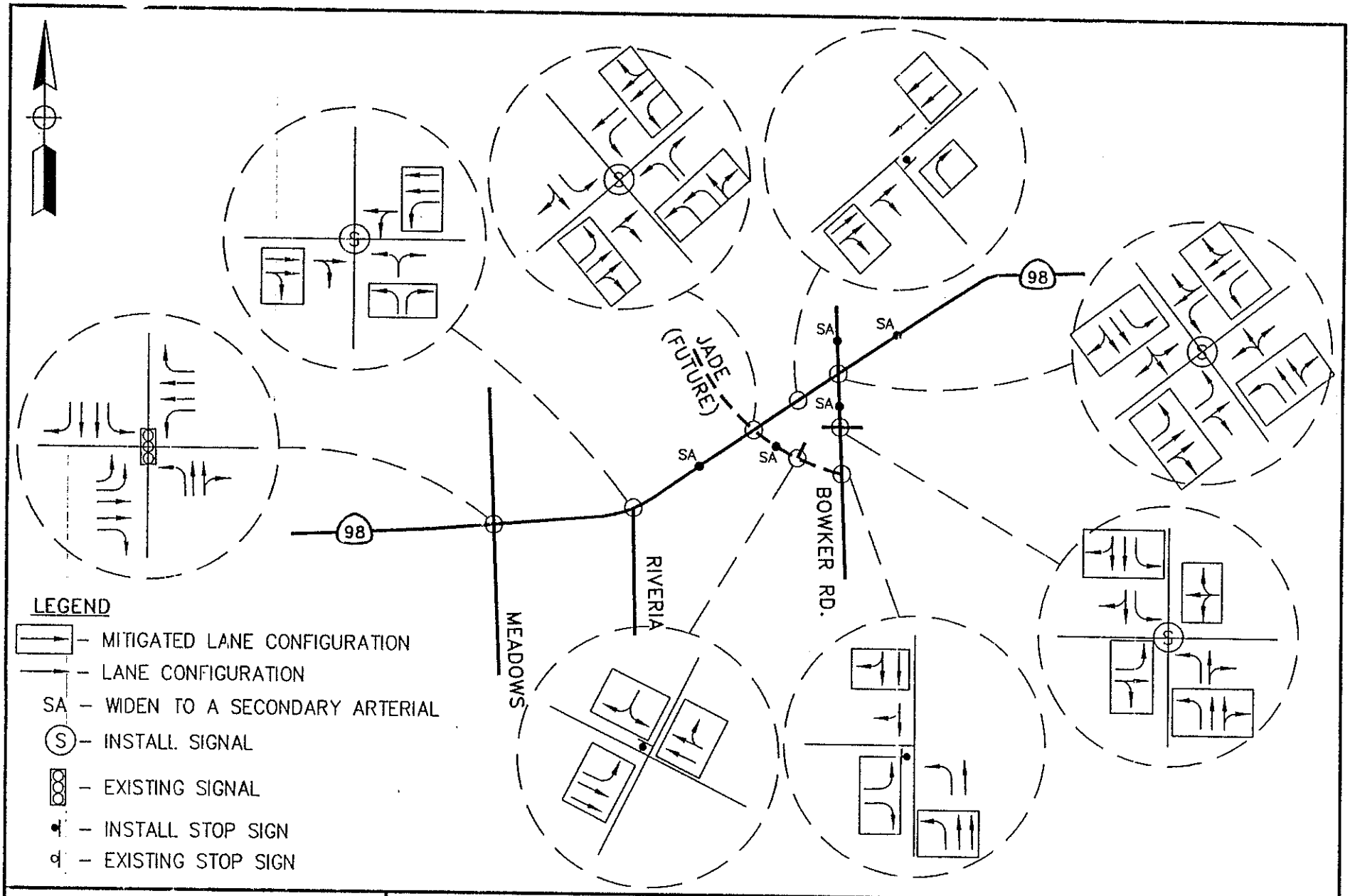

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FIGURE 30

MITIGATED NEAR TERM CUMULATIVE (ALTERNATIVE 1) CONDITIONS

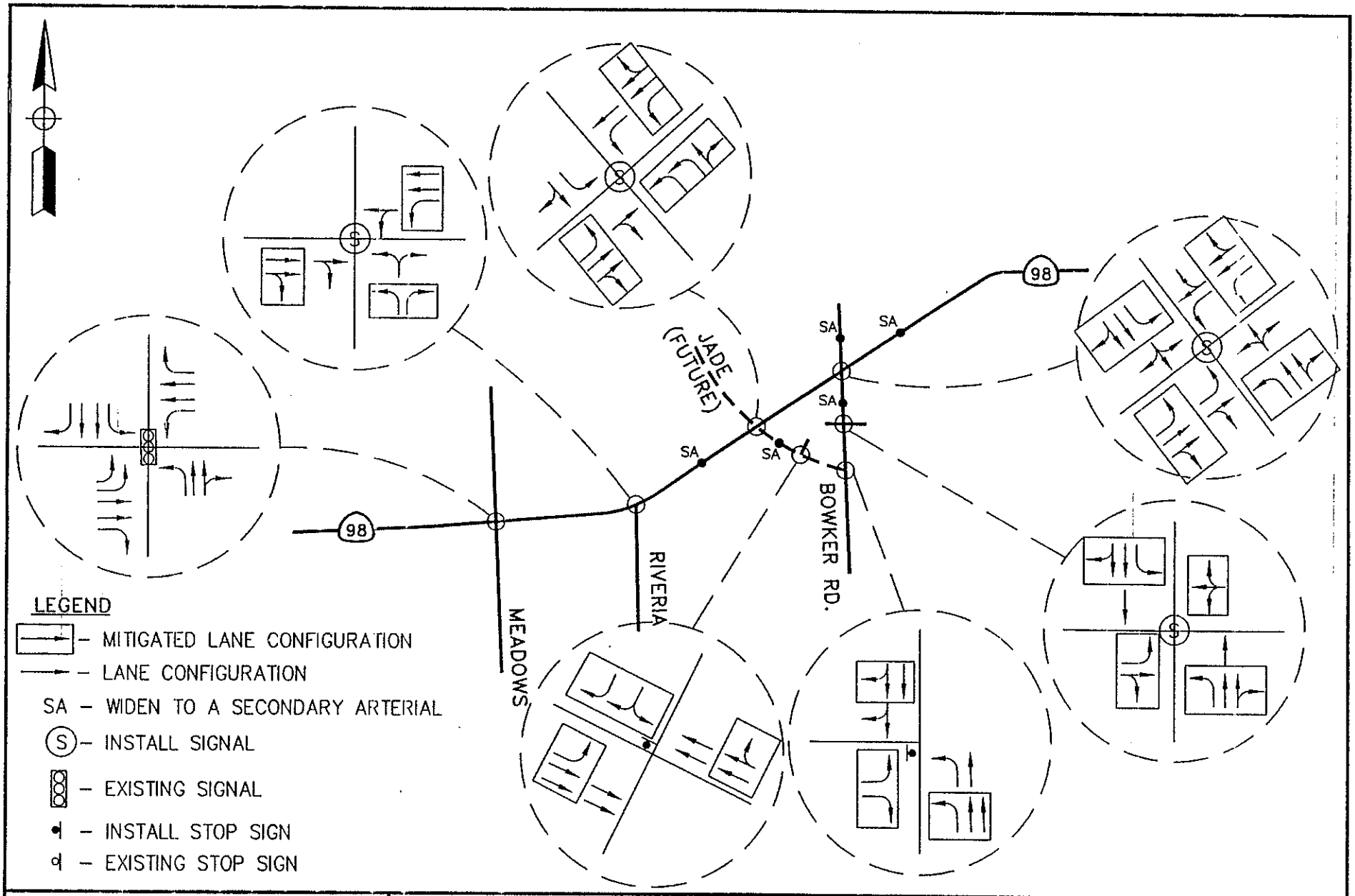

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FIGURE 31

MITIGATED NEAR TERM CUMULATIVE (ALTERNATIVE 2) CONDITIONS

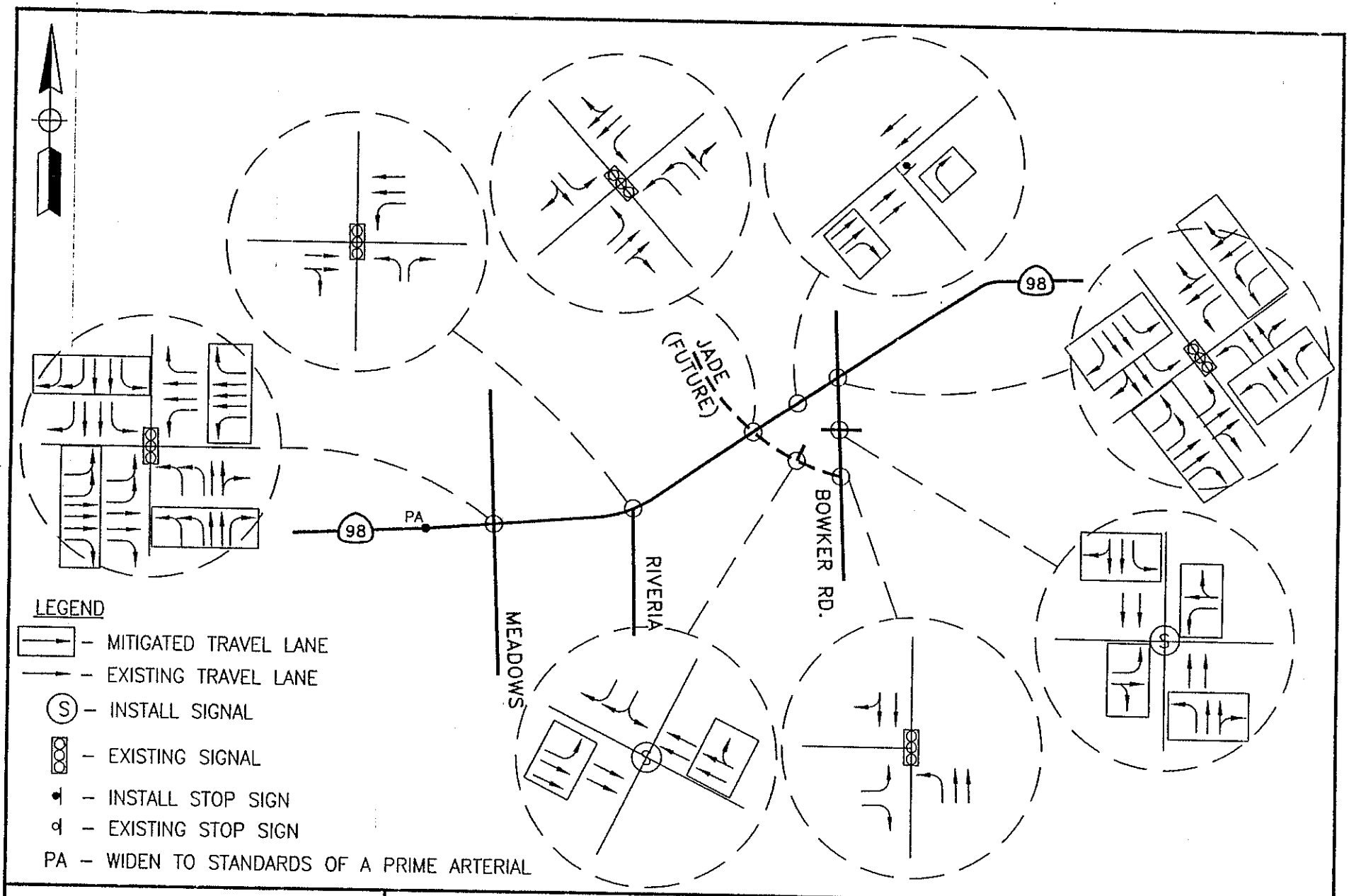

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FIGURE 32

MITIGATED 2030 (ALTERNATIVE 1) CONDITIONS

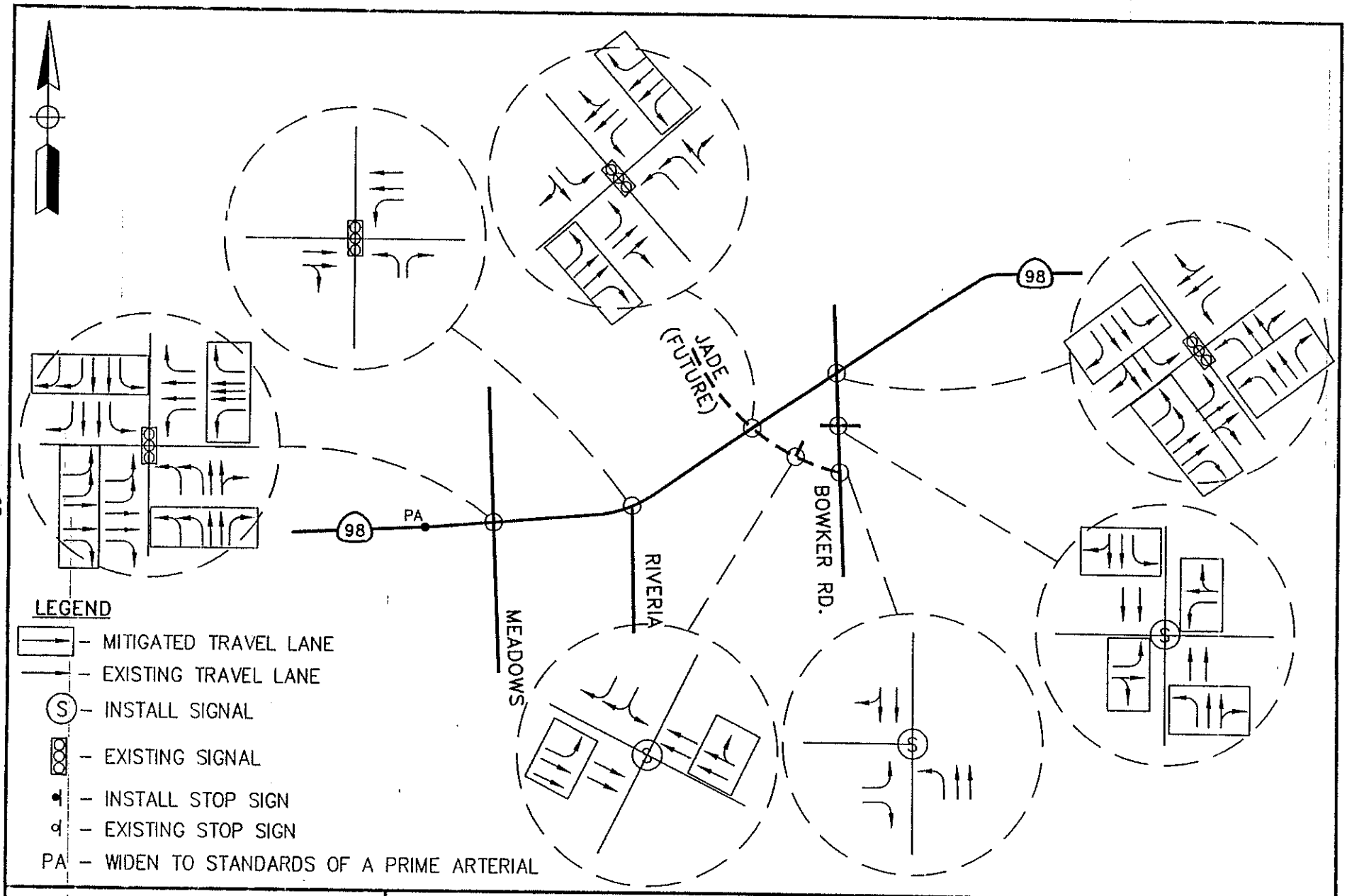

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FIGURE 33

MITIGATED 2030 (ALTERNATIVE 2) CONDITIONS

Table 22 - Summary of Roadway Segment Impacts & Mitigation				
Roadway Segment	Type of Impact		Project Mitigation	
	Alternative 1	Alternative 2	Alternative 1	Alternative 2
SR98 Meadows to Bowker	Cumulative	Cumulative	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction
Bowker Cole to SR98	Direct	Direct	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction
	Cumulative	Cumulative	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction
South of SR98	Direct	Direct	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction
	Cumulative	Cumulative	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction	Widen to classification of a Secondary Arterial by adding an additional Travel lane in each direction
Jade SR98 to Bowker	Direct	Direct	Construct as a Secondary Arterial with a center two-way left turn lane	Construct as a Secondary Arterial with a center two-way left turn lane
	Cumulative	Cumulative	Construct as a Secondary Arterial with a center two-way left turn lane	Construct as a Secondary Arterial with a center two-way left turn lane

Table 23 - Summary of Intersection Impacts & Mitigation			
Intersection	Type of Impact	Alternative	Required Mitigation
SR98@ Meadows/Andrade	Future	1 & 2	Add eastbound/westbound through lanes, northbound left, northbound right, and southbound right
SR98 @ Rivera	Short Term	1 & 2	Signalize
	Cumulative	1 & 2	Signalize and add additional east/west through lanes
	Future	1 & 2	Add eastbound right lane
SR98 @ Jade	Direct	1 & 2	Signalize and construct south leg of the intersection
	Short Term	1 & 2	Signalize & add North bound left turn lane
	Cumulative	1 & 2	Signalize and construct south leg of the intersection
	Future	1 & 2	Add eastbound right and westbound right, lanes
SR98 @ Project Access	Direct	1	Construct as one lane of ingress and one lane of egress, right turns only, stop controlled on the access approach
	Short Term	1	Construct as one lane of ingress and one lane of egress, right turns only, stop controlled on the access approach, with a eastbound deceleration lane
	Cumulative	1	Construct as one lane of ingress and one lane of egress, right turns only, stop controlled on the access approach, with a eastbound deceleration lane
	Future	1	Construct as one lane of ingress and one lane of egress, right turns only, stop controlled on the access approach, with a eastbound deceleration lane
SR98 @ Bowker	Direct	1 & 2	Signalize
	Short Term	1 & 2	Signalize
	Cumulative	1 & 2	Signalize and add additional north/south travel lanes and east/west travel lanes
	Future	1 & 2	Add eastbound left, eastbound right, northbound right, and southbound right lanes.
Jade @ Project Access	Direct	1 & 2	Construct as one lane of ingress one lane, of egress, stop controlled on the access approach
	Cumulative	1 & 2	Construct as one lane of ingress one lane, of egress, stopcontrolled on the access approach
	Future	1 & 2	Signalize
Jade @ Bowker	Direct	1 & 2	Construct south leg of the intersection as OWSC, eastbound
	Cumulative	1 & 2	Construct south leg of the intersection as OWSC, eastbound
	Future	1 & 2	Signalize
Bowker @ Project Access	Direct	1 & 2	Construct east and west legs of intersection and as all way stop controlled
	Short Term	1	Construct east and west legs of intersection and as two way stop controlled
	Short Term	2	Construct east and west legs of intersection and as all way stop controlled
	Cumulative	1 & 2	Construct east and west legs of intersection, signalize

Table 24 - Summary of Fair Share Analysis					
Intersection	Alternative	Existing Traffic	Future Traffic	Project Traffic	Fair Share
SR98@ Meadows/Andrade	1	1,552	6,840	523	9.89%
	2		6,840	523	9.89%
SR98 @ Rivera	1	406	4,000	523	14.55%
	2		4,000	523	14.55%
SR98 @ Jade	1	442	3,985	876	24.72%
	2		4,000	891	25.04%
SR98 @ Bowker	1	459	4,884	1,075	24.29%
	2		4,950	1,141	25.41%
Jade @ Bowker	1	13	2,932	275	9.42%
	2		2,965	308	10.43%
Fair Share Percentage = Project Traffic ÷ {Future Traffic – Existing Traffic}					

SECTION VII - SUMMARY OF FINDINGS AND CONCLUSIONS

- The Venezia subdivision is located south of the intersection of Bowker Road and State Route 98. The project consists of approximately 249 single family dwelling units and 13.89 acres of commercial property (approximately 138.259 net building square-footage).

- The project will generate approximately 19,081 average daily trips, 863 AM peak hour trips, and 1,908 PM peak hour trips. When pass-by reductions are applied to the project, the project will generate 10,288 average daily new trips, 511 AM peak hour trips, and 1,244 PM peak hour trips.

- The project's impacts are summarized in Section IV and the mitigation is summarized in Section VII.

City of Calexico

Planning Department

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Appendix A – K of this Traffic Study are available at the City of Calexico Planning Department Please contact Mark Vasquez at 760-768-2118 or Tony Wong, City Engineer at 760-768-2100